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from your president |

In this, my final message, I wish to inform you of a few of the more important activities of the A. S. D. C. during the past year.

A permanent joint Liaison Committee composed of members of the A. S. D. C. and the American Academy of Pediatrics has been organized to make an exhaustive study in the areas of diet, nutrition and dental health; the primary purpose of this Committee being to eventually publish a booklet as an authentic source of material for both professions. The A. S. D. C. is represented by a group of outstanding educators to work with similarly qualified representatives of the A. A. P.

During the past year the Membership and State Units Committee, under the capable guidance and inspiration of Al Anderson, has had several notable accomplishments. First, we were happy to grant a Unit Charter to the State of New Mexico. Secondly, an aggressive membership program on both a National and State Unit level has been a major project, as has also been our Junior Membership campaign with the ultimate objective of having membership in every Dental School throughout the Nation. It is a pleasure to announce that a revised Procedure Manual will be available at the Annual Meeting. There is a constant demand for this publication and its revision is most welcome.

The Chairman of the Public Relations Committee has worked most diligently in cooperation with the Public Relations Bureau of A. D. A. to complete revisions of the pamphlet "Pointers for Parents". The Executive Council has approved this excellent pamphlet which is now available through the Public Relations Bureau of the A. D. A.

With the exception of our Journal, (which in the future you can expect on time!) our Annual Meeting holds the greatest interest for our membership. The magnitude of this meeting and its associated responsibilities have made it necessary for the Executive Council to create a standing Committee, the Annual Meeting Committee. At the recent ad-interim meeting a Committee was appointed to make a comprehensive study and subsequent publication of an Annual Meeting Procedure Manual. A more detailed report on this and related matters will be made at the Annual Meeting, which will be held at the Balmoral Hotel, in Bal Harbour, Miami Beach, Florida. I urge you to send in your hotel reservation *NOW* to assist the Local Arrangements Committee and assure your accomodations at the Convention hotel.

See you in Miami Beach, November 1, 2 and 3!

LARRY BURDGE

ONE SECOND REGISTRATION

It's Miami Beach in '57

Register early for the

1957 ANNUAL MEETING

AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN

November 1, 2, 3, 1957

Balmoral Hotel, Miami Beach, Florida

Fill in Pre-registration form below and when you arrive at the registration desk you will receive:

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I desire ____ ticket (tickets) for the Catamaran Boatride Saturday afternoon, November 2nd, 1957. Tickets are $1.50 per person.

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PROGRAM

1957 ANNUAL MEETING

Balmoral Hotel—Miami Beach—November 1, 2, 3

Friday—November 1

4:00 P. M.	Registration open.
6:00 P. M.	Executive Council Dinner Meeting.

Saturday—November 2

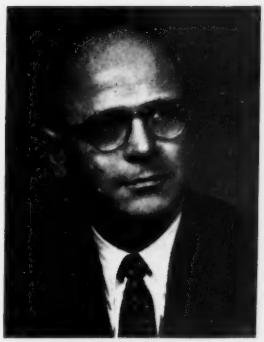
8:00 A. M.	Registration open. *Please register as early as possible.*
9:00 A. M.	Opening ceremonies.
9:30–12:00 Noon	Closed circuit television program. South Florida Cleft Palate Team will present a program on Diagnosis, Surgery, Orthodontic and Pedodontic consultation, and Prosthetic restorations for cleft palate patients.
Noon to 2:00 P. M.	Lunch.
1:00–5:00 P. M.	Catamaran sailboat ride for the family.
2:00–3:30 P. M.	State Units Delegates Meeting
3:30–5:00 P. M.	General Business Meeting—A.S.D.C.
7:00 P. M.	Cocktail Party, Dinner Dance and entertainment, honoring President and Mrs. Lawrence R. Burdge. Installation of officers.

Sunday—November 3

8:00 A. M.	Registration open. Breakfast for clinicians.
9:00–12:00 Noon	Table clinics.
Noon to 2:00 P. M.	Lunch.
2:00–5:00 P. M.	Scientific Program: The Practical Approach to Preventive Orthodontics.

The Practical Approach to PREVENTIVE ORTHODONTICS

T. M. GRABER, D.D.S.
Kenilworth, Illinois.
Orthodontist—Associate Professor of Orthodontics, Northwestern University. School of Dentistry, Chicago, Illinois.



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Pedodontist-Associate Professor of Pedodontics, University of Washington.

A Panel With A PUNCH!!

CLIFFORD L. WHITMAN, D.D.S.
Hackensack, New Jersey.
Orthodontist — Assistant Clinical Professor, College of Physicians and Surgeons, Columbia University.

Don't miss this
SUNDAY AFTERNOON SCIENTIFIC PROGRAM.
November 3, 1957.

A Digest of the Practice of Pedodontics—conclusion*

SAMUEL D. HARRIS, D.D.S.

CHAPTER XV

Periodontal Conditions

"The problem of gingivitis and of deeper periodontal disease is one which receives relatively little attention in papers and discussions regarding dental conditions in children's mouths. This is, of course, only because caries so completely overshadows periodontal lesions in the minds of both dentists and laymen. Gingivitis of some degree is practically universal in the mouths of children seen at the Guggenheim Clinic. It varies widely in degree and extent. It may involve one or two teeth only and present merely a slight thickening of the marginal gingivae without noticeable redness of this tissue; it may, at the other extreme, involve every tooth in the mouth in a generalized soft tissue inflammation—the gingivae showing a marked redness which may extend from the gum margin over the alveolar mucosa to the mucobuccal fold. Ulcerative inflammations are fairly rare in our experience. Smears from these cases are often characterized by more or less complete absence of the spirochete, and favorable response of these cases to orange or lemon juice, as part of the treatment, points to the probability that they have a scorbutic basis."[1]

Ellertson and Askine state:

"According to most authorities, Vincent's infection generally does not occur in children under 14. What is ascribed to Vincent's is acute herpetic stomatitis. The causative organism is the herpes virus, and this acute condition is caused by the initial inoculation. It does not occur in children having the more chronic condition known as 'canker sores.'

"The disease is differentiated from Vincent's by the fact that the interdental papillae do not necrotize and become blunt.

"This condition does not respond to treatment, but resolves itself in seven to ten days. Since severe discomfort may accompany the disease, palliative treatment is necessary—aspirin or empirin compound with codeine ¼ grain, plus frequent oral lavage with warm saline. Penicillin troches are contra-indicated, especially in low dosages because of the possibility of creating penicillin resistant organisms.

"Some evidence has been presented that terramycin may be beneficial, but it has been my experience in treating more than twenty cases in the past eight years that time and supportive treatment alone produce precisely the same results as the use of antibiotics."

* Presenting the final chapters of Part two of Dr. Harris' work.

Nemir[2] supports this position. She says:

"Recently emphasis has been given to herpetic lesions of the oropharynx. Dodd[3] and co-workers in 1938 first associated the ulcerations in the mouth with the herpes virus. Later Scott[4] and others described more fully this acute infection of children between one and six years of age characterized by high fever, sore throat, and sore mouth. The chief lesions of this infectious herpetic gingivostomatitis consist of a fiery red gingiva, multiple small ulcers upon the tongue, in the soft palate, and other parts. Earlier the small vesicles preceding the breakdown into ulcers may be seen. Ulcerations commonly appear around the gingival tissue of partially erupted teeth. Viral studies clearly incriminate the herpes virus as the etiologic agent. *Penicillin lozenges are contraindicated.*"

She also states:

"From the experience with tonsillectomies and the onset of bulbous poliomyelitis, it seems wise to advise that elective exodontia be postponed during the poliomyelitis season. On the other hand it is possible that severe dental caries may furnish a portal of entry for the polio virus. Investigation in this field is needed."

Easlick holds that:

"Epidemiological studies of the Public Health Service have done a job of exploding the fear of cavities and extractions as etiological factors in polio."

Wood, Sullivan, Lampshire, Straus, Taylor, Smith and Massler concur that Vincent's is extremely rare in children. Their treatment usually consists of relieving the symptoms to give the patient as much comfort as possible together with administering antibiotics to prevent secondary infection which is the danger of this disease. Wood is strongly of the opinion that treatment of periodontal conditions should be left to the dentist rather than to the physician, as in his experience, "the physician knows little about it."

For canker Coleman uses 10% trichloracetic acid with care not to touch any other tissue. Glasser reports good success with:

"2 mg. of Chlor-Trimeton four times a day for three days. Results are usually noted within 24 to 48 hours. Treatment is then continued for another 24 hours after disappearance of the canker sores to prevent a possible recurrence. A response to an antihistaminic seems to suggest a possible sensitivity factor in the origin of apthous stomatitis."

Massler cautions that this is not without its dangers.

Nemir, reports in the Journal of Dentistry for Children, Fourth Quarter, 1954:

"Lesions of the oral cavity are seen often during infections in children. The acute contagious disease may have pathognomonic signs in the mucous membranes; for example, Koplik spots of measles. Other findings may be the strawberry tongue of scarlet fever, the occasional vesicles on the mucous membranes in varicella, and the swollen Stenson's duct in epidemic parotitis.

"Systemic disease such as subacute bacterial endocarditis, meningococcemia, and purpura may produce small hemorrhagic areas on buccal mucous

membranes and palate. These are sometimes the early signs of blood stream invasion; hence their observation is of the utmost importance."

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3. Dodd, K., Buddingh, G. J. and Johnston, L.: Herpetic Stomatitis. J. A. M. A. **58:** 907, 1939.
4. Scott, F. M., Stergman, A. J. and Convey, J.: Acute Infectious Gingivostomatitis. J. A. M. A. **117:** 999, 1941.

CHAPTER XVI

Anesthesia, Endodontics, and Minor Surgery

THE subject of ethyl chloride in dentistry for children has come in for considerable discussion. Those who use it are strongly impressed with the simplicity of its administration and its effectiveness. Those who do not, and likely have not, pass along the arguments given them perhaps in their schooling. The biggest of these is its implied danger. This may be true with deep narcosis. In service for children deep narcosis is not advocated nor required.

The stage sought is simply the primary stage. We administer just sufficient anesthetic to produce barely a loss of consciousness. With this method, reporting on 149,598 cases in 1933, Jacobs stated, "It is to be noted that the mortality is zero." The mortality rate reported for nitrous oxide by Gwathmey[1] is 1:10,000.

In 1950 Booth, Forsyth Infirmary director, reporting on ethyl chloride in the magazine, "Oral Surgery, Oral Medicine and Oral Pathology," said this in his summary:[2]

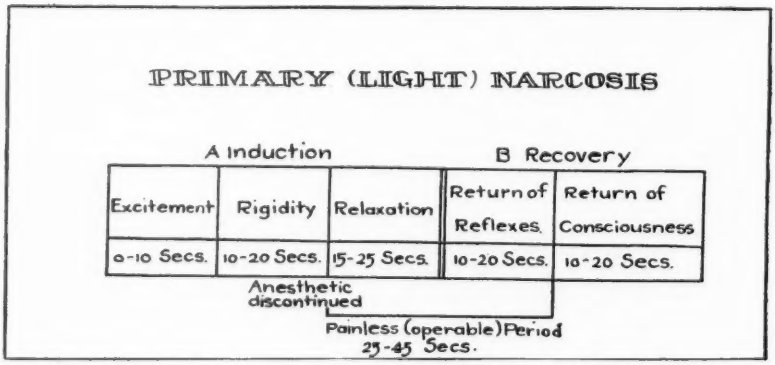

Fig. 21. Graph—light narcosis. The maintenance period (which comes after the relaxation and before the return of reflexes with deep narcosis) is unnecessary and omitted with light narcosis.

"Ethyl chloride as a general anesthetic has been used at the Forsyth Dental Infirmary for Children for the past thirty-five years. It is ideal for office or clinic use and is indicated for short procedures on children when a complete general anesthesia with maintenance period is not required."

Asked in 1954 to comment on the rumor that Forsyth was using less ethyl chloride, Booth replied:

"Other agents, particularly vinethene, are found to be more convenient, possess a wider margin of safety, and permit a better opportunity for teaching the fundamentals of general anesthesia."

Concurring with Booth, Fredrickson[3] states:

'Vinethene is not the anesthetic agent of choice for dental surgery on children and is used in place of ethyl-chloride because of its overriding advantages:

1. Its effect is not cumulative.
2. There is less masseteric spasm.
3. The absence of undesirable after-effects, as postanesthetic vomiting, nausea, and collapse.
4. The patient is able to leave the office within a short period after the completion of the dental operation."

Tapper, Erwin, and Barker are among the many who continue to prefer ethyl chloride and offer these special suggestions for its use: Tapper says, "It is routine in our office to check the child for head colds, embarrassed breathing, and rheumatic fever. If you check the incidence of rheumatic hearts in children, you will find it quite high. We also like to use the GAAM mask." Erwin[4] holds the ethyl chloride tube close to the mouth and opens the valve to permit a 'drop' application.

"At conclusion of the administration, as the desired symptoms are attained, the gauze is given another few quick drops and then lightly thrust into the mouth back of the field of operation NOT as a throat pack but rather as a throat screen. This also helps to continue the anesthetic a bit longer."

Barker indents the cotton gauze rather than have it flat in order to bring the anesthetic more into the child's mouth.

Because we have discussed general anesthesia for children at some length, the reader is apt to believe that its use is frequent. Actually the majority of even those who limit themselves to children use very little general anesthesia. "Let's give local anesthesia the credit it is due—a good agent with no risk," says Wood. "98% of our extractions are performed under local. I believe general is preferable for the other 2% which includes spastic and mentally retarded children and multiple extractions." Myrick speaks for the majority of dentists serving children when he says, "Use of a local anesthetic for performing routine extractions is no problem on children above the age of three."

This is supported by the Guggenheim clinic in its December 31, 1954 report. Treating over twenty-five thousand children through the year, it administered four hundred locals to each general anesthetic (13,397 local to 33 general).

In choosing a local we may be influenced by the findings of a clinical comparison of local anesthetics reported to the American Academy of Pedodontics in 1950.[5]

> "Four local anesthetic agents were compared clinically for their effects during dental operative procedures: Xylocaine 2% with epinephrine 1:50,000; Ravocaine 0.75%, Novocaine 2% with Levophed 1:30,000 (RNL); Unacaine 3.8% with Supronal 1:60,000; Xylocaine produced the greatest incidence of soreness at the site of injection, followed by RNL and Unacaine. Complete anesthesia was achieved more often after Xylocaine followed by RNL. Postoperative swelling and edema was highest after Unacain and lowest after RNL. Blood was aspirated in 2% of the cases indicating that routine aspiration is indicated prior to all injections."

Tainter[6], Easlick[7], Del Papa[8], and Hunnicut[9] agree that topical applications prior to injection of the needle may have some psychological value to the hypersensitive patient. Burdge explains, "Use of topical anesthetic for the most part can be only psychological since stratified squamous epithelium is of an excretory function." Accordingly, Klenda[10] has determined, as have many, that ". . . the best topical anesthetic you can buy is a good sharp needle."

In the administration of the local, however, Lewis[11] suggests that for the patient to "see no needle" is the most important part of our psychological technique. His procedure is as follows: He has the child rinse his mouth. This is to divert attention from the dentist (the body action also serves to burn up some of the child's adrenalin, the fear chemical, and lessens apprehension). The dental nurse hands the dentist the syringe which he cradles in the palm of his hand to make the necessary injection. Beechen[12] states, "The reason for concealment is obvious, but it is amazing how often this precaution is overlooked." Maple likes to tell the child that the anesthetic is "sprayed" on the gums and allowed to "soak in."

Regarding the "single" injection procedure—no palatal on uppers, no buccal on lowers—described in Part One, many asked the question posed by Burdge, "Does not the patient experience discomfort lingually when fitting a band around the upper tooth?" The following pictures illustrate the completeness of anesthesia with the single injection method.

Davitt asks, "For extraction of primary teeth, do you not find the patient experiences some pain?" We have observed no pain. Others who have since written have also observed no symptoms of pain.

The single injection method has been used exclusively in the writer's practice for quite a number of years. The occasion for reinjection seldom occurs. After trying it, McBride wrote, "The no buccal injection for lowers and no lingual for uppers is a departure which I am going to employ."

McBride also wrote, "I noted your use of novocaine on both sides of the face at the same time. Since, I have tried it a number of times, and find it as you say." The bilateral injections elicited considerable interest.

The problem of stopping hemorrhage occurs at some time in every practice. Mercer, M.D.[13] suggests:

> "Simple pressure is one of the most effective means of controlling hemorrhage and one of the most neglected. The patient may have completely normal blood as far as coagulation is concerned, but clotting takes time and an effective clot cannot form on a freely bleeding surface. If sufficient

FIG. 22

FIG. 23

FIG. 24

FIG. 25

FIG. 26

FIG. 27

FIG. 22. Mandibular block, both sides, using no buccal injection, showing anesthesia of the buccal tissues.

FIG. 23. Maxillary posterior, simple infiltration at muco-buccal fold, using no palatal injection, showing anesthesia of the palatal tissue.

FIG. 24. Maxillary anterior, routine infiltration, labial fold, no palatal injection.

FIG. 25. The same area as figure 24 showing anesthesia of the palatal tissues.

FIG. 26. Maxillary posterior, routine infiltration, buccal fold, no palatal injection.

FIG. 27. The same area as figure 26, showing anesthesia of the palatal tissue.

FIG. 28

FIG. 29

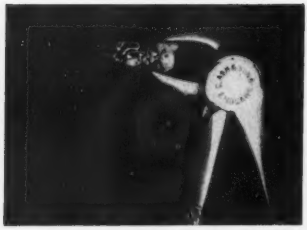

FIG. 30

FIG. 31

FIG. 32

FIG. 28. The same as figures 26 and 27, extraction of the upper primary second molar.

FIG. 29. Following mandibular block with no buccal injection, extraction of the lower primary second molar.

FIG. 30. The size of the molar extracted in figure 29.

FIG. 31. Following mandibular block with no buccal injection, extraction of roots of the lower primary first molar.

FIG. 32. Following removal of the roots extracted in figure 31.

pressure is applied to prevent free bleeding and held long enough for normal coagulation to take place, bleeding may be completely controlled. Direct manual pressure over a pack is probably the most effective method. It is difficult to place or tie in a pack in such a way that it will exert adequate pressure by itself.

"In the unusual case of continued bleeding, the bleeding tooth socket should first be wiped or suctioned free of flowing blood. At the instant the wound is clean, thrombin of a potency in the range of 1000 units per cc. should be applied. If the thrombin is used in a syringe, the entire bleeding surface can be flooded at once."

Premedication is a vast, promising, and almost untouched field in dentistry for children. Salas[14] suggests that it can provide four benefits: "1. Psychic; 2. Heighten pain threshold; 3. Decrease metabolism; 4. Reduce toxic reactions." He says:

"The barbiturates for children are of special value as they can be given in elixir manner. As an elixir, we usually give a child of 4–10 years of age, four teaspoonfuls or one grain one-half hour prior to surgery. A child 10–14, six teaspoonfuls or 1½ grains. Remember that barbiturates not only serve their purpose of pre-medication for general anesthesia, but also reduce the toxic reactions of local anesthetic."

Lampshire has done considerable good work with pre-medication. He writes, "I now use demerol much more often than I do the barbiturate sedatives such as seconal and nembutal, both in conjunction with demerol, and also as singular pre-medication."

Lampshire reported at the 1955 Academy of Pedodontics meeting on the administration of demerol for two hundred children 3 to 12 years of age prior to dental treatment to produce sedation and cooperation.

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6. Tainter, M. L. and Moore, S. M.: Studies in Topical Anesthesia. I. The Efficacy of Certain Common Anesthetics When Used on the Gums. J. A. D. A. **23:** 244–50, February, 1936.
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CHAPTER XVII

Sodium Fluoride

IN a recent survey among dentists by Germond,[1] 98% replied in the affirmative to the question, "Do you recommend the topical application of sodium fluoride?," 95% replied affirmatively to the question, "Do you favor fluoridation of community water supplies?" Wood and Taylor did call attention to the Public Health Service' research evidence: "A surface which has had caries experience receives very little if any benefit from the topical application of sodium fluoride."

Massler[2] found that the mechanical preparation of the enamel surface markedly influenced the rate of fluoride uptake. He thus recommends polishing the teeth with a slur of fine flour of pumice followed by whiting in a revolving rubber cup prior to the first application.

Of considerable interest are the anticariogenic possibilities of stannous fluoride. Muhler reported:

> "The comparison of stannous fluoride with sodium fluoride as an anticariogenic agent was made by studies with powdered enamel, whole tooth sections, experimental rat, hamster dental caries studies, and human topical programs. All of these means of evaluation indicate a superiority for stannous fluoride."

Recently, an editorial comment appeared in the "American Dental Association Journal" on the possibilities of a dentifrice containing stannous fluoride.

1. GERMOND, ROBERT C.: A Survey of Current Practice Procedures. Amer. Journ. Orthodont. **41:** 506–525.
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CHAPTER XVIII

Diet and the Endocrines

IT was Sir George Newman who said, "Health is won by a way of life rather than by a bottle of medicine."

Johnson[1] spoke in this vein recently when he said:

> "Carefully-controlled surveys of infants, children, mothers, workers, and older people, reveal the presence of subclinical deficiency in a high percentage of the public.
>
> The current danger of these maladies is not that they threaten death, but that they take away all enjoyment of life. Their victims exist on a low level of mental and physical vigor."

Commenting editorially in the "American Dental Association Journal," Morrey stated:

> "It is now known that caries is unnecessary; moreover if already developed, its progress may be stopped with persistent use of a good diet. It is also known that it is the present diet of the individual which is the most important factor in the production of caries or its arrest, not that of the far distant past."

One of the essentials to an effective dietary program appears to be a carbohydrate restriction. An evaluation of such restriction is given.

AN EVALUATION OF CARBOHYDRATE RESTRICTION

(1). Q. How effective is carbohydrate restriction?

A. It has been demonstrated that a close correlation exists between the number of lactobacilli in the saliva and the degree of dental caries activity. It also has been found that the number of these oral organisms can be reduced sufficiently to arrest dental caries by the restriction of carbohydrate in the diet. Jay has stated that a diet restricted to 100 grams of carbohydrates with protein and calories adequate for the age and activity of the patient for a limited period (2 weeks) has reduced successfully the aciduric bacteria in at least 78 percent of the people who cooperate with dietary control.[2]

(2). Q. How practical is carbohydrate restriction?

A. Only those cooperative patients with a lactobacillus count of 10,000 or more should be considered for treatment by dietary restriction; and then only with the full cooperation and supervision of a qualified person. Patients with conditions such as allergies, peptic ulcers, colitis and cholocystitis are not likely candidates for the dietary control of dental caries.[3]

(3). Q. Is elimination of sugar from the diet harmful?

A. There is no real need of sugar at all, providing that the diet is kept balanced relative to the amount of carbohydrate and proteins. The Council (U.S.A. Council on Foods and Nutrition) concludes that it would be in the interest of the public health for all practical means to be taken to limit the consumption of sugar in any form in which it fails to be combined with significant proportions of other foods of high nutritive quality. If a diet is adequate in the quantity and quality of all nutrients, the healthy child will not have an abnormal craving for sweets, especially sugar.[4]

(4). Q. What is the effect of starches on the caries attack rate?

A. Sugars, as such, are far more effective in producing dental caries than are starches. In some individuals it is necessary to restrict the starchy foods as well as free sugar in order to obtain favorable results in the dental caries attack rate.[5]

Jay continues, "Dental caries is primarily the result of a metabolic disturbance; that its control rests largely with the correction of faulty diet has been fundamentally proven."

Bunting and Jay have shown that sugar intake is apparently a very important factor, and Hanke has pointed out that our sugar intake per person is seven times that of one hundred years ago.

Erwin prints and distributes to his patients a carbohydrate evaluation sheet.

Hanke points out the fact that caries always occurs in regions of stagnation. Wahl[6] in his direction for a systematic youth dental service in Western Germany states:

> "Food which scours the teeth such as stable wholemeal bread, apples, and carrots is not sufficient to replace regular dental care, but may prevent many residues of food adhering to the teeth and so causing caries. Repeated recommendation of such food is therefore really justified. The feeding of school children should also be checked with this in mind."

Drain[7] suggests that our advice would be better if it were suggested for ". . . correction of the diet of the whole family rather than the singling out of any individual member."

And Myrick states, "Granted . . . cooperation is difficult to obtain, this does not mean our responsibility is eliminated in making an effort. 'One little candle . . . . may light the way'."

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3. Jay, Philip: Nutrition and dental caries, N.J.S. Dent. Society **15:** 20–4, January, 1944.

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Christie, Amos: Diet to reduce L. Acidophilus content of saliva: a pediatrician comments. Calif. S. Dent. Assoc. Journ. **16:** 185–9, September–October, 1940.
5. Jay, Phillip: Nutrition and dental caries, N.J.S. Dent. Society J. **15:** 20–4, January, 1944.
6. Wahl: Directions for a Systematic Youth Dental Service in Western Germany, Second Edition, German Committee of Youth Dental Services.
7. Drain, Charles L.: The Care of the Child Patient. Iowa Dent. Bulletin **19:** 133–138, October, 1933.

CHAPTER XIX

Capsule Comments

MCBRIDE—Too much idle talk with the child makes him familiar, and this, in turn breeds a type of conduct that impairs discipline and hinders accomplishment.

Olson—Some children appreciate getting an empty carpule for a whistle.

Fain—I find some younger patients do not seem to understand when you ask them to open their mouth. I have them say aaah, this always makes them open wider.

Hyatt—85% of primary and permanent molars and bicuspids have pits and fissures. Only one child in 550 can be safely excused from the necessity of filling the fissure in the first permanent molar prior to 12 years of age.

Lokka—Only one in 2,250 fissures does not decay.

McBride—Silver nitrate precipitation in fissures does not inhibit caries and the resultant discoloration obscures all evidence of . . . . disintegration.

Richards—The very young patient must be *told* what to do, *asking* implies that an answer is expected.

J. Dent. Res.—A single missing molar reduces chewing ability about half, two non-opposing missing molars reduce it about four-fifths.

Sweet—Simplest and most effective means for giving a sedative is to open the capsule and mix the powder with sugar water in a teaspoon.

Menczer—Of 125 questionnaires sent to cities of over 90,000, two-thirds answered. Two-thirds of these authorized excusing children from school for dental appointments.

Gorelick—Young's frame for the rubber dam is specially valuable for use with children. It requires no straps around the head. Clamps commonly used are SSW #30R, 31L and Ivory 2 and 14.

Gasaway—A common mistake is to "wait until the cavity preparation becomes painful" before using anesthesia. When in doubt, inject beforehand.

Peabody—Cement bases gave me trouble until I learned to use a very thin slow mix and flow it off an explorer after dipping it in alcohol. Wipe explorer after each application.

Hogeboom—The spot welded matrix is the most efficient.

Massler[1]—One hundred per cent of the young adults whose dental roentgenograms were examined showed evidence of some degree of root resorption in four or more permanent teeth.

Gibbin—Children are great boosters. They influence grownups, who in turn help to fill our appointment books.

Easlick—Dentistry for children is the foundation upon which a successful and permanent general practice of dentistry must be built.

Schwartzman—Eruption of the first primary molar caused the most profound teething disturbances; the lower centrals next.[2] Lancing of the gingiva is not approved.

Erwin—If grandmother cremates the meat, so will mother and the child; if the bread must be white for mamma, and dad insists on spuds and apple pie, the kids learn to eat thusly.

Stine—I could not practice without the Ivory cotton roll holders. I can keep an area dry for thirty minutes without changing cotton rolls on the lower arch.

Album—With general anesthesia, under hospital conditions, it now becomes possible for the dentist to rehabilitate the mouth of a recalcitrant or handicapped child in one visit.

Selbe—Pertaining to gagging, Xylocaine Ointment applied both to the palate and sublingual areas eliminates the involuntary gagging.

Lewis—Topical anesthetic has been eliminated because of the burning or stinging sensation which the child patient experiences.

Castaldi—I favor parents assisting children in brushing hard-to-get-to tooth areas longer than the sixth year. Gesel in his book "The Child From Five to Ten" shows that few children can handle a knife and fork effectively 'til nine.

Bodecker—Primary teeth mature more rapidly than do permanent teeth, their crowns pass through the cycle of maturity by 8 to 10 years of age. Permanent teeth remain highly permeable ten or fifteen years after their eruption.

The pulps of primary teeth appear to have greater recuperative power than those of the permanent teeth. The reason for this difference is unknown.

MacGregor—Dentistry for children cannot be done profitably if we recommend a "Cook's tour" for every child who enters the office.

Brandhorst—I cannot refrain from sounding a warning regarding the extraction of primary teeth without a preliminary roentgenographic survey to make sure permanent successors are present. It will save much embarrassment, to say the least.

Cellett—The neurotic person constantly utilizes reactions which the normal person finds necessary only at especially difficult times. They are exaggerated defense measures inappropriate to the life situation and are called forth by faulty self-evaluations and faulty evaluation of the environment.

Brooks—He who serves a child helps humanity with an immediateness which no other help in any other stage of life can possibly give again.

Gies—Dentistry owes it to her sense of public duty, and to her professional self-respect, to rise to the full height of her present opportunity in oral health

service—dentists as a body should be trained to give systematic health service, and to become not only dental surgeons and oral engineers, but also oral physicians and oral sanitarians.

Jay—In caries susceptible individuals, oral lactobacillus counts are considerably reduced when the daily carbohydrate intake is sharply curtailed. After dietary treatment, the carbohydrate content of the diet may be increased to its original level but the lactobacillus counts will remain low in the majority of individuals.

Kauffmann[3]—The supreme ideal of the dental profession should be to eliminate the necessity for its own existence. The most effective approach is tied in with dentistry for children.

1. Massler, Maury and Perreault, J. George: Root Resorption in the Permanent Teeth of Young Adults. J. Dent. Child. **21:** 158–164, (4th. Q.), 1954.
2. Neanderland, Ralph: Teething—A Review. J. Dent. Child. **19:** 127–132, (3rd. Q.), 1952.
3. Kauffmann, Joseph H.: The Preventive Concept, Its Critical Significance. N. Y. State Society of Dent. Child. **6:** 1–4, No. 2, May, 1955.

CHAPTER XX

Observations

OLIVER WENDELL HOLMES once said, ". . . each of us is an omnibus in which all of our ancestors are seated." Just fancy 144,115,188,075,855,870 ancestors in less than 2,000 years!

New Jersey dental examinations reveal that 54% of the children never have dental care, of this group those old enough to have first permanent molars have lost thirty percent. This contrasts with one percent loss in those children examined in the same age group who had had fillings.

United States Public Health Service—When we recall that the teeth and tonsils are considered to be main portals of entry for the organisms which cause heart disease and that about seventy-five percent of the cardiac involvements resulting from acute rheumatic fever develop in children under twelve years of age, we must be impressed primarily with the desirability of preventing pulp involvement during childhood; and secondly with conservative, intelligent treatment of already exposed or infected pulps.

Eastman—Money spent in the care of children's teeth is one of the wisest expenditures that can be made.

Dean—Fluoridation should noticeably change the practice of dentistry in the next generation. With dental caries being brought under a large measure of control, it may easily be visualized that dentistry would undergo a gradual transition from a practice preoccupied with an unending demand for dental repair to the more satisfying practice of a comprehensive oral health service, based on the sound biological principles of preventive dentistry.

Spaulding—Life is a game, why take it so serious? For God's sake let us help

Him, in our small way, to work out His evolution by doing our work from day to day, listening for direction from that "still small voice". We will hear it if we are not making too much noise with our own importance.

Lundergan[1]—Dental disease is universal and, although only approximately 30 percent of the population regularly receive dental service, the value of dental health should be taught to the entire population.

Wilbur[2]—Every child should have regular dental examination and care.

Thompson[3]—Think of dentistry for children—that will do much. Talk of it—that will do more. Practice it—that will do most.

Salzman—Charles H. Mayo stated that 60 per cent of the cases in the Mayo clinic come there as a result of oral infection.

Erwin—In 1935 the per capita consumption of sugar for every sucking babe and old man was 96.5 lbs. The more recent figures from the department of agriculture is 115 lbs. Theater snack bars, sugar coated cereals—food rubbish are loaded with caries.

Brandhorst—Ours is the responsibility for the normal development of the face, which is to become the source of pleasure or distress, joy or sorrow, not only to the individual himself but also to everyone around him.

McCall—Beginning dental treatment at an early age, preferably 2 years, is prompted by the figures on the incidence of caries in those already examined; by the opportunity thus presented to prevent caries or greatly minimize its incidence and spread; by the economy of such a program of prevention and conservation, and by the fact that, almost without exception, the very young patient is the best patient.

Kulstad—The American Dental Association has directed most of its public education program efforts towards dentistry for children. The health education materials developed and distributed are almost exclusively in this field.

Fulton—We may conclude then, that dentistry can add its weight to others who are working with children in this matter of changing the course of society. Granted that human behavior is a complex thing which does not lend itself to superficial analysis; granted that frustration and maladjustment is the rule rather than the exception; granted that the scope of the problem is staggering; still, the world is at the crossroads, its only hope being that the children coming on will be emotionally mature; at least mature enough to resolve the world's difficulties without bloodshed.

Dentistry can set its sights high. It can raise a standard and work towards it. It can make dental care a means to a much larger end. It can resolve to make every child better able to face the social problems which will inevitably confront him.

1. Lundergan, Leo: Preventive Dentistry and Preventive Orthodontics Through Public Dental Health Education. J.A.D.A. **41:** 554–564, No. 7, July, 1955.
2. Wilbur, Roy Lyman: Medical Progress in an Economic World, Committee on Cost of Medical Care, Washington, D. C.
3. Excerpt from a letter to Fellows of the American College of Dentists from Harry S. Thompson, (President of the College.) Congratulations, Dr. Thompson. J. Dent. Child. **21:** 117, (2nd. Q.), 1954.

Conclusion

DENTAL schools give four percent of their curriculum to training in service for children.[1] This is certainly better than the four-tenths of one per cent of two decades ago—but why not considerably more? Of course, as Easlick points out, "a high percentage of preclinical and clinical dental study as a student is just as essential to practice for children as for adults". However, if children under fourteen number fully thirty per cent of our population, why do not dental schools and dental societies and dentists in practice give them at least thirty per cent of their time? This is a reasonable question the world over.

The World Health Organization in its constitution states, "Health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition."[2] This, then, should be the normal heritage of the two billion people who cover the globe. Yet, it isn't even true for children. For example, in the United States nine out of ten preschool children require dentistry—only one receives it.[3]

True, "scientific" dentistry is young. Yet, we in dentistry have not been without fault in establishing the status quo. A generation ago—and to a lesser degree today—we condone the public attitude that dentistry for children should "ride half-fare," that permanent teeth compared to the primary set were somehow "holier than thou." The result was that less than one in five children entered school needing orthodontics; four out of five emerged requiring the service. They emerged too, with so serious a dental breakdown that "dental causes" became the number one reason for rejection from military service. Dental conditions were re-defined as the War progressed and changed these data; however, at best, what a commentary this is on our state of dental advancement!

What to do? Obviously, act where our service counts most. Every mother's son and daughter in dentistry must assume a fair share of the dentistry for children that needs doing—that should take thirty per cent of our time on the average. In addition, we can perhaps encourage a substantial reduction in carbohydrate and sugar intake—fortify or replace sugar with something that will serve its purpose without inflicting sugar's damage. If in the meantime we can, perhaps, pull another miracle like fluorine out of a bottle, we will go far towards really conquering man's number one disease.

In the meantime, when people ask us if primary teeth are important—as important as permanent teeth—let's answer, "Decidedly yes." Through the years I am leaning to the opinion that care of the primary teeth is more important than care of permanent teeth. Why? Because in addition to the same reasons for their care, health, comfort and appearance, there are two more—preservation of occlusion and fundamental prevention. Also, there is the extreme advantage of proper mental conditioning early and the greater effectiveness of catching faults when they are small.

Is the care of primary teeth more important than permanent? I think so. Surely the care of primary and *young* permanent teeth is more important than care of adult permanent teeth. Dental neglect is never desirable; however if I

had to submit to a period of neglect for myself or my family, I would sooner it occurred after twelve than before. Two and a half to twelve and a half is perhaps the most important decade in an individual's life for close dental supervision.

Our mounting experience with children confirms the fact that service for the child is the most important service dentistry can administer. Children's dental care is the most effective, the least expensive, and the most useful dental care parents can procure. The earlier in the child's life the program can be initiated, the better. The start should never be delayed beyond the child's third birthday.

Dental health is childhood's fundamental right; it should be every child's inviolate heritage . . . this is dentistry's trust. The individual family dentist, the world over, has it in his hands to grant it.

1. LAMONS, FRANK F. AND MORGAN, MARY LYNN: Overcoming physiological and psychological blocks in dentistry for children. J.A.D.A. **44:** 15–21, January, 1952.
2. Palmer of the American Child Health Association reported to the White House Conference that nine out of ten preschool children had caries with only one out of ten receiving any dental attention.
3. PERKINS, JAMES E.: The World Health Organization. Journ. Dent. Med. **10:** 107–115, No. 3, July, 1955.

NOTICE

In compliance with our By-laws, we publish herewith the following appointments made by President Larry Burdge for our 1957 Annual Meeting:

Nominating Committee: Sidney Kohn, Chairman; Norman R. Olson and Gordon Rovelstad.

Auditing Committee: Douglas Sanders, Chairman; Robert Burchesky and Wendell Whetstone.

Ectopic Eruption of the First Permanent Molar*

DOROTHY H. YOUNG, B.S., D.D.S.†

ECTOPICALLY erupting first permanent molars have been reported in the literature as early as 1923 by Chapman[2] but still very little is known about the peculiar behavior of these teeth. Brauer,[1] Cheyne and Wessels,[3] Fisher,[4] Lewis,[5] Morgan,[6] MacGregor,[7] McBride,[8] McCall and Wald,[9] Nikiforuk,[10] Salzman,[11] Shoham,[12] Sweet,[13] Thomas,[14] Ungar,[15] and Willet[16, 17] have added links of understanding to this problem. The purpose of this study is to add another link to the chain of knowledge concerning this dental anomaly. Ectopic eruptions of permanent teeth may occur in either jaw and in varied positions, but this presentation deals only with the first permanent molar.

What is meant by the expression "ectopic eruption of the first permanent molar"? The permanent tooth is prevented from appearing in the oral cavity or is blocked from completely erupting by some portion of its mesial surface becoming locked under the distal contour of the second primary molar. This locked position may be only a temporary aberration or forced act on the part of the molar. After causing considerable destruction to the roots and crown of the adjacent tooth it discontinues its mischievousness, releases its hold and erupts normally. On the other hand, it may not release its hold, the resulting catastrophe being the early loss of the primary second molar, either mechanically or by abnormal exfoliation. The cases explained in the first instance will be referred to henceforth as *jump* cases and those in the second group as *hold* cases.

* Presented at the American Academy of Pedodontics Meeting, Milwaukee, Wisconsin, June 1956.

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SELECTION OF MATERIAL

Material for this study was collected from two separate sources. They will be designated as Groups A* and B. The cases from Group A were obtained from a private practice for children and those in the Group B from the University of California School of Dentristry records. The cases were selected on the basis of the presence of the four second primary molars and the activity of the four permanent first molars discernible either by x-ray or x-ray plus visual observation.

FINDINGS

1. The study covers a period of years from 1942 to 1956.

2. The combined number of cases in Groups A and B amounted to 1619; 817 in Groups A of which 386 were boys and 413 girls, and 802 in Groups B of which 408 cases were boys and 394 girls.

3. The children selected in this project were of white heritage and reside in San Francisco or its vicinity in the state of California.

4. Among the 1619 boys and girls, 52 presented 78 ectopic eruptions of the first permanent molar of which 31 were *hold* cases and 47 were *jump* cases. (See Chart 1)

* A more thorough investigation of this anomaly was possible in the A group than in the B Group.

5. This abnormality may occur either in the mandible or maxilla, unilaterally or bilaterally, or it may involve all four first permanent molars.

Composite picture of the 52 cases:

Group A:

1 girl, single *hold*, mandible
7 girls, single *jump*, maxilla
2 girls, both sides *jump*, maxilla
5 boys, one *hold* and one *jump*, maxilla
4 boys, both sides *hold*, maxilla
2 boys, both sides *jump*, maxilla
4 boys, single *jump*, maxilla
3 boys, single *hold*, maxilla

Group B:

1 girl, one *hold* and one *jump*, maxilla
1 girl, both *hold*, maxilla
1 girl, both *jump*, maxilla
6 girls, single *jump*, maxilla
1 girl, single *hold*, maxilla
1 boy, all molars, three *hold* and one *jump*, maxilla
2 boys, one *hold* and one *jump*, maxilla
3 boys, both *jump*, maxilla
1 boy, both *hold*, maxilla
3 boys, single *hold*, maxilla
5 boys, single *jump*, maxilla

6. Distribution of the 31 *hold* cases and the 47 *jump* cases:

	Right Side				Left Side				Group
	Hold cases		Jump cases		Hold cases		Jump cases		
	Males	Females	Males	Females	Males	Females	Males	Females	
Maxilla	8		4	5	8		9	6	A
Mandible						1			
Maxilla	4	3	6	3	4	1	8	6	B
Mandible	1				1				

Ectopic eruptions are by far more prevalent in the maxillary arch. The anomaly shows no right or left difference.

Group	Sex	Hold Cases	Jump Cases
A	18 males	16	13
	10 females	1	11
B	15 males	10	14
	9 females	4	9
Total	52	31	47

CHART 1

In Group A, 17 upper right molars, 23 upper left molars, and 1 lower left molar were involved. In Group B, 16 upper right molars and one lower right molar, and 19 upper left molars and one lower left molar were involved.

7. This dental anomaly occurs more frequently with boys than with girls, 19 girls as compared to 33 boys. In girls, there is considerable probability that the first permanent molar will *jump*, while in boys there is an equal chance that a *hold* or *jump* will occur. Roentgenographic evidence indicated that girls presented 5 *hold* and 20 *jump* teeth and boys presented 26 *hold* and 27 *jump* teeth. (See Chart 1)

8. One out of every 31.1 youngsters possessed one or more ectopically erupting first permanent molars, but of these only one out of every 52.2 youngsters has one or more *hold* teeth. Sixty-six per cent of all ectopically erupting molars jump the hurdle and erupt normally.

CLINICAL STUDIES

1. Ectopic eruption of the first permanent molar is one of the factors responsible for the early loss of the second primary molar. It can be an important factor in malocclusion.

2. The type of occlusion apparently is not related to the occurrence of this dental anomaly. Most of the cases fall into the Class I division, but this abnormality exists also in the Class II and Class

III groups. Both *jump* and *hold* cases have occurred with crowded anterior teeth or where there were spaces between these teeth, and in mouths where the upper anterior teeth have protruded.

3. An unfavorable health report, either systemically or orally, is not an exciting cause of this irregularity since nearly all of the children in this study have good health records.

4. Diet does not appear to be involved in the production of this anomaly.

5. No case is caries free.

6. What part heredity might play in the occurrence of this condition cannot be determined from the material collected in this study.

7. Pain does not usually accompany this anomaly unless some other condition is present, such as carious pulp exposure of the second primary molar.

Roentgenographic Studies

1. An upper permanent molar may start to erupt ectopically anywhere along its eruptive path. Regardless of whether it starts at the apex of the disto-buccal root of the second primary molar or at the cervix, the disto-buccal root of the primary molar is resorbed. The lingual and mesio-buccal roots may be destroyed in varying degrees or completely annihilated. (See Cases "A", "B" and "E")

2. The roots of the upper second primary molar may be completely destroyed and a large part of the crown resorbed at six years of age, even before the permanent molar appears in the mouth. (See Case "E")

3. In the *jump* group, the pulp chamber of the second primary molar may be exposed and later secondary dentin laid down obliterating the exposure. (See Case "C")

4. The destruction of the crown of the second primary molar appears as a well defined sliced area, or a gouged out area defined or diffuse. This destructive area starts at, below or above the cemento-enamel junction. It may remain below the floor of the pulp chamber, extend to the roof of the pulp chamber, or extend above the pulp chamber. The pulp chamber may or may not be reached by the resorptive process. When the pulp is involved, only a small portion may be encroached upon or the entire pulp chamber may be completely destroyed. In the *jump* group, destruction may be minimal, encompassing only a small area of hard tooth structure at the cemento-enamel junction or the pulp tissue may become involved.

5. Resorption of the primary tooth in both the *hold* and *jump* groups begins long before the permanent molar erupts into the oral cavity. There may be extensive loss of tooth structure within two months time.

6. Roentgenograms show that a permanent molar may unexpectedly begin to erupt in an ectopic manner. (See Case "A")

7. Root tips may remain after the primary molar is lost, or they may be severed from the crown of the tooth before it is shed.

8. The length of time it takes for a *jump* molar to show signs of erupting ectopically, upright itself and erupt normally is from six months to two years.

9. *Jump* cases occur before or at the time the permanent molar is making its appearance into the oral cavity.

10. An interesting observation disclosed by the x-rays is that where the permanent tooth finally locks under the distal contour of the primary molar, there it stays. It does not progress further mesially, even if it causes total destruction of the roots, as well as a good portion of the crown of the first tooth.

The permanent molar may retrace some of its distance distally by uprighting itself, thus causing less space loss, but it does not go further mesially. The position of the foothold depends upon the degree of angulation which the molar takes in erupting. Most cases are just into the dentin.

11. Infection, as observed visually and roentgenographically, does not appear to be a characteristic of the abnormal behavior of the permanent molar, even though the permanent molar has practically demolished the neighboring tooth. If infection is present, some other condition accompanies this anomaly, particularly carious pulp exposure of the primary molar.

12. The lower first permanent molar is positioned so that it is directed upward and forward in the jaw in relation to the line of occlusion. When it erupts ectopically it continues on that slant instead of uprighting itself. Fortunately, most of the ectopic eruptions occur on the upper jaw. Only three of the 31 *hold* teeth fell into this group. Moving the upper molar with its round conical roots distally does not present as much of a problem as that of the broad, flat rooted lower first permanent molar.

13. In the upper jaw, the first permanent molar shows roentgenographically that this tooth is directed downward and backward in relation to the line of occlusion. (See Case "A") When it begins to erupt, the mesial cusps lead and present themselves in the oral cavity first. In ectopic eruption the mesial cusps lead. However, they are not the first to be seen in the mouth; the distal cusps appear first.

An ectopically erupting permanent molar may select one of two directions of eruption. In the first direction of eruption the adult tooth erupts broadside. The mesial surface of the permanent tooth as a whole brushes along the distobuccal root and distal surface of its neighbor. This produces a slicing action (See Case D) and when it finally locks under the distal contour of the primary molar the entire mesial marginal ridge is caught. With this type of hold, the tooth remains in a more or less upright position. The occlusal surface of the upper permanent molar remains almost parallel to the occlusal surface of the lower molar. Space loss is at a minimum in this instance. Sometimes so little space loss results that the permanent molar does not need to be pushed backward. The angulation of the erupting permanent molar determines whether extraction of the adjacent tooth should be early or delayed. If the x-ray shows a mesial marginal ridge grasp there is a 66 per cent chance that the molar will jump the hurdle and erupt normally.

In the second direction of eruption the permanent molar rotates so that the mesio-buccal cusp becomes locked under the distal contour of the primary tooth. The occlusal progress of the mesial cusps is retarded, while the distal cusps continue to erupt, thus producing a greater eruption angulation. Space loss is greater in this type. The tooth is rotated and tipped to a considerable degree. In this classification it is wise to extract the primary molar early. Only six of the 31 *hold* teeth fell within this group.

Case Presentation

The following selection of cases will exemplify many of the findings reported in this study:

Case "A"

1. Selected from Group A. Sex, male.

2. Both maxillary first permanent molars are in the *hold* group. This case

CASE A

CASE B

depicts the mesial marginal ridge type of lock.

3. "A's" progress has been followed for six years.

4. "A" had his first x-ray survey taken at the age of five, but the x-rays selected portray specific desired material. The left side x-rays were taken at the age of five and one-half. Only two and one-half months elapsed between the upper and lower roentgenograms on the left side. These show the unexpected happening. (X-rays were taken on both sides during this short interval of time because of indecision relative to treatment.) The upper left first permanent molar misbehaved also. "A" was seven years old when the picture on the right side was taken and the model of the teeth made. The upper right primary second molar shown above was extracted four weeks later. The upper left primary second molar was exfoliated one and one-half years after the permanent molar assumed the abnormal eruption. The right primary molar was extracted at that time and a space maintainer constructed to maintain the space on both sides. Roentgenograms of the second bicuspids, when "A" was nine, revealed insufficient space for their normal eruption. A fixed appliance was used to open space for the second bicuspids.

5. Occlusion: There is a Class I relationship. A closed bite and spaces occurred between the upper anterior teeth.

6. Health was good: Measles, mumps and chickenpox were the only childhood diseases. These diseases were contracted before the permanent molars erupted.

7. Diet consisted mainly of soft food.
8. A number of fillings were necessary.
9. Roentgenographic and clinical findings in the ectopic area:
   a. The pulp chamber of the second primary molar is exposed.
   b. The distal buccal root is completely resorbed and resorption has taken place on the lingual root.
   c. Infection is absent.

Case "B"

1. Selected from Group A. Sex, male.
2. The upper right maxillary molar is in the *hold* group. It demonstrates the mesial buccal cusp type of lock.
3. The above x-ray was taken when "B" was seven. The amount of destruction evident occurred in a little over a year's time. The model of the teeth was made at the time the x-ray was taken and the second primary molar was extracted one week later.
4. "B's" dental progress has been followed since he was five years old, and it is still being observed.
5. "B" is the second child in a family of four children. This condition did not develop in two of the other children; the fourth, a baby, is yet too young for diagnosing. The parents and other relatives, as far as is known, were not afflicted.
6. Occlusion: There is a Class II relationship. Spacing of the teeth, as well as protrusion, is characteristic of this case.
7. Health was good. Only the childhood diseases of measles, mumps and chickenpox have been contracted. The first permanent molars were not in the oral cavity at the time these diseases were contracted.
8. Diet consists mainly of soft food, but the teeth were unusually clean.
9. Carious activity was not extensive.
10. Roentgenographic and clinical findings in the ectopic area:
    a. The pulp chamber of the second primary molar is exposed. The distal buccal root is completely resorbed and a portion of the lingual root has been destroyed, as seen in the x-ray and the extracted tooth.
    b. There is no evidence of inflammation or infection of the supporting structures.
    c. The lock of the permanent molar is well into the dentin of its neighbor, an expected expression of this type of ectopic eruption.

Case "C"

1. Selected from the A Group. Sex, male.

CASE C

2. Both maxillary first permanent molars are in the *jump* group.

3. "C" was seven years old when first examined.

4. One year elapsed between each set of bite-wing x-rays.

5. "C" has one sister who is two years younger. She had no evidence of ectopic eruption of the first permanent molars.

6. Health: Hypothyroidism was discovered at the age of ten. He had the usual childhood diseases of measles, mumps, and chickenpox.

7. Occlusion: Study models are a part of the record. This case falls into the Class I classification. A crossbite existed on the right side. Also there was insufficient space in the upper arch for the permanent laterals. They erupted in a lingual position during the ninth year.

8. Diet consisted mainly of soft food, but the teeth were unusually clean.

9. Carious areas were present.

10. Roentgenographic and clinical findings in the ectopic area:

a. A permanent molar can jump the hurdle and erupt normally. (Sets 1 and 2)

b. The hugging action of the permanent molar can produce minimal destruction, as seen on the upper right primary molar, or extensive destruction as demonstrated by the pulp exposure on the upper left second primary molar. (Sets 2 and 3)

c. The recuperative powers of the exposed pulp is demonstrated by its ability to fabricate secondary dentin. (Set 4)

d. Alveolar bone resorption produced by the misdirected eruption of the adult tooth can be repaired. (Set 4)

e. Infection is absent around the first permanent molar and second primary molar areas. (Sets 1, 2, 3 and 4)

Case "D"

1. Selected from the A Group. Sex, female.

2. The upper left first permanent molar is in the *jump* group.

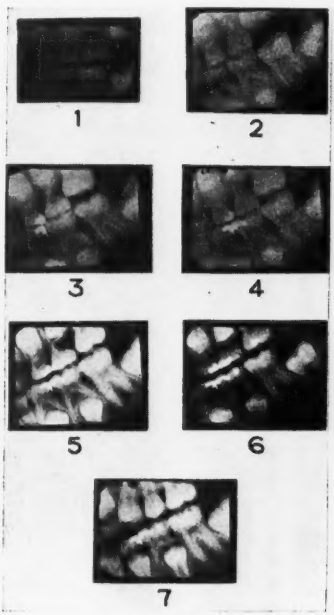
3. The growth and development of this child was followed between the ages of three and ten.

4. She was an only child.

5. Health was good. Only childhood disease contracted by the age of ten was measles.

6. Occlusion: The teeth are ideally aligned. Their classification is a Class I. Study models were taken.

7. Many coarse foods were included in the diet and sweets were eaten in minimal amounts. Still "D" had to have ten restorations placed by the time she was



CASE D

ten. Home care of the teeth was excellent.

8. Roentgenographic and clinical findings in the ectopic area:

a. The bite-wing x-rays that were taken when she was three years old do not show the activity of the first permanent molars. She was five and one-half years old before the bite-wing survey of her teeth revealed the action of the teeth concerned in this study. This is the first picture shown in the series. The progress of the permanent molar can be followed from the position of the occlusal third of the disto-buccal root of the primary molar. The root appears to be resorbing ahead of the steady advance of the broadside contact of the permanent tooth, as shown in the first picture. The second picture, taken seven months later, shows that the disto-buccal root has disappeared and that a sizeable portion of tooth structure just below the cemento-enamel junction has been gouged out. The third picture, taken after another seven months delay, shows that the privacy of the pulp chamber has been invaded. The fourth picture was taken after an elapse of another seven months. The adult tooth is moving away from the scene of its harmful work. By now the tooth structure in the pulp region has been destroyed to its mesial aspect. The outline of the pulp chamber is no longer ascertainable. In the fifth picture, taken one year later, the first permanent molar is in occlusion and the primary second molar is doing a good job despite the injuries inflicted upon it. The permanent molar spent two years in erupting into occlusion after it hooked into the distal contour of its neighbor. Six months later the second bicuspid is almost ready to occupy its place in the arch (sixth picture). The seventh picture, taken ten months later, shows a healthy bicuspid in occlusion.

Case "E"

1. Selected from the B Group. Sex, female, six years of age.

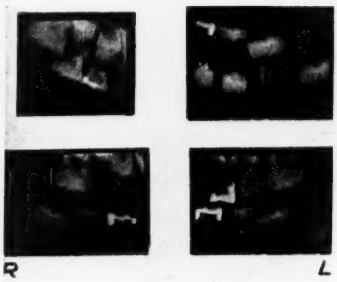
2. Roentgenograms are the only records available. The permanent molars are quite a distance from erupting into the oral cavity. They have a very small hold on their victims which have almost vanished from existence. Also, the permanent tooth does not appear to be drifting further mesially. It has remained in the position where it originally locked under the distal contour of the primary molar.

Case "F"

1. Selected from Group B. Sex, male.

2. The four first permanent molars were involved in the ectopic eruption ac-

Case E



Case F

tivity. Three were in the *hold* position and the upper left molar was in the *jump* group.

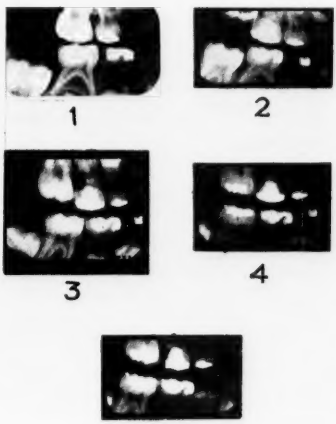
3. The dental progress of this case was followed for two years, between the ages of five and seven. Five sets of study models were made at various intervals during the two year period.

4. Occlusion: Models and x-rays taken at the age of five belie the orthodontic problems that eventually developed. The primary teeth were ideally aligned. Future orthodontic intervention was foreseen when the upper and lower anterior teeth started to erupt. There would not be enough space in the dental arches for all permanent teeth to take their rightful places. Three of the first permanent molars added to the difficulty by erupting ectopically in the *hold* position.

5. The single x-ray of the upper right first permanent molar area was taken at the age of six. It shows:

a. The hold is just into the dentin on the upper portion of the gingival half of the crown.

b. The pulp chamber is exposed.



CASE G

c. There is no sign of infection.

The other three roentgenograms were taken when "F" was seven. They show:

a. The apparently weak hold of the permanent molar (lower right and left) on the primary tooth is not comparable to the vastness of the destruction.

b. The permanent molar has no tendency to slip beyond its final hold on the adjoining tooth.

c. It is quite possible that the lower left primary molar will leave a root fragment in the mandible.

d. The pulp chambers are extensively exposed.

e. The abnormality is not complicated by the presence of infection.

Case "G"

1. Selected from B Group. Sex, female.

2. The upper right first permanent molar is in the *jump* group.

3. The patient was five years and ten months old when the first x-ray in the series was taken. The following x-rays in the sequence were taken at six years and eleven months, seven years, seven and one-half years, and nine years and one month.

4. She is the fifth child and second girl of six children—four boys and two girls.

5. Health was good, but she was allergic to eggs, chocolate, peanut butter and nuts.

6. Diet consisted mainly of soft foods; the sugar intake was high.

7. Mouth hygiene was poor.

8. Many restorations had to be placed.

9. A coronal pulpotomy was done on the upper second primary molar at six and one-half years. Sometime between the taking of the first and second x-rays, a period of one year and one month, the first permanent molar started to erupt ectopically, was released from its hold and erupted normally. The coronal pulp-

otomy was done before the first permanent molar erupted.

10. Infection marks this case. The primary molar should have been extracted earlier.

Summary

1. The points emphasized in this investigation on ectopically erupting first permanent molars are:

a. What is meant by the expression "ectopic eruption of the first permanent molar."
b. The frequency of occurrence.
c. The combination of occurrence.
d. The position in the jaw in which this anomaly is most commonly encountered.
e. The influence of sex on its occurrence.
f. The seriousness of its occurrence.
g. The types of ectopic eruptions encountered and how they influence the diagnosis.
h. The importance of occlusion, health, diet, caries and heredity on its occurrence.
i. Its association with other physical or oral defects.
j. Where and when the first permanent molar starts its mischievous conduct.
k. The amount of destruction inflicted on the second primary molar before the permanent tooth erupts.
l. The recuperative and protective powers of an exposed pulp.
m. The apparently weak hold of the permanent molar on its victim and the vastness of its destruction.
n. The lack of infection.

2. In the collection of these cases, the information gained has been rewarding, but still the data have only scratched the surface and added one more point of understanding to this important problem.

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Pain Control in Dentistry for Children*

JEROME L. FECHTNER, D.D.S.

IDEAL dental treatment for children is based upon the active cooperation of the young patient. If pain, fear and apprehension could be eliminated from children's dentistry, more dental services would be performed. If, in the dental procedures of disease elimination, pain is inflicted on the patient, then one of the primary goals of dentistry has been lost. This paper will review current pain control methods and will discuss analgesia as a valuable adjunct of pain control in children's dentistry.

REVIEW OF LITERATURE

There can be no justification of, or logical explanation for the necessity of painful dental procedures; whether by personal choice of the dentist, or because of the difficulty of administering pain control measures. The patient is often in a fearful or apprehensive state when he seeks dental care. Therefore, it is the duty and responsibility of the dentist to be proficient in the use of every instrument and modality of pain control which is available to the profession.[1] "As has been pointed out time and again, the fear of pain probably keeps more people away from the dental office than any other one cause. Few dentists today are incapable of preventing and relieving pain for most patients. Many, however, are unskilled in coping with the fear exhibited by over-apprehensive persons."[2] "Oral pain, from the earliest history of dental care, has been the scourge which has driven suffering humanity to seek the ministrations of the dentist; and yet, it has kept many from availing themselves of dental care."[3] Particularly in the field of dentistry for children, the control of all phases of pre-operative, operative and post-operative pain is essential. For "the responsibility of the dentist in operative procedures is to use every means at his command to reduce pain and unpleasant sensations so that the fear of the dentist may be gradually reduced."[4]

A survey of the literature reveals an increasing number of papers related to the control of pain of disease, and the control of pain of operative and surgical procedures. Current pain control methods include the use of local anesthetic agents;[5, 6, 7] the newer operative procedures including carbide and diamond instruments, water spray and high speed rotational instruments;[8, 9] chemotherapeutic sedatives, hypnotics and tranquilizers;[10, 11, 12] psychological approach; hypnosis[13] and the use of general anesthesia.[14–19] This interest in pain prevention has been an integral part of the dental profession, dating from the important discovery of general anesthesia for tooth extraction by Horace Wells on December 11, 1844.[20]

From that time forward, the development of pain control in dentistry has been mainly in the direction of the use of local anesthetic agents of many types. The use of general anesthesia in dentistry reached a low ebb because of the abuse of anesthetic agents and the lack of adequate training. After World War II, a

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resurgence of interest and knowledge caused a revival of study in the use of general anesthesia in dentistry.[21] In the recent literature, there are many references to the use of general anesthesia for the mentally or physically handicapped child.[22, 23, 24] This method has been suggested in cases of badly neglected or ravaged mouths for extensive caries,[25] multiple extractions,[26] or to eliminate prolonged visits.[27] The types of anesthesia which are recommended, include rectal thiopental sodium,[28] ethyl chloride anesthesia,[29, 30] vinethene and ether,[31] and nitrous oxide-oxygen with trichlorethylene.[32, 33, 34, 35]

In addition to its recent popularity as used in general anesthesia, trichlorethylene has also been suggested as an analgesic agent,[36, 37] usually self-administered by the patient.[38, 39] Its safety has been questioned and it has been suggested that its use be limited to trained anesthesiologists.[40, 41] Its use in a patient controlled inhaler is to be condemned for obvious reasons.[42]

In contrast with the detailed literature concerning previously described pain control methods, there is almost no reference to be found describing the use of nitrous oxide-oxygen analgesia in children's dentistry. There seems to be a lack of understanding of the results which may be attained with nitrous oxide-oxygen analgesia for either the normal or handicapped child. The term, analgesia, as used in this paper, refers to the first plane of general anesthesia in which there is a lack of sensibility to pain, with minimal or no loss of consciousness.[43] This paper will suggest the use of routine analgesia which will eliminate the hazards and expense of general anesthesia procedures for many of these "problem" children. Nevertheless, the writer recognizes the value of a sound general anesthesia procedure, in cases where all other measures have failed.

The use of nitrous oxide analgesia in cavity preparation dates back to 1889 in Liverpool, England.[44] Some interest in analgesia for adult operative dentistry was evidenced in the literature from 1913–1918, and also from 1932–1938. These two flurries of interest produced no real progress in introducing analgesia to the normal armamentarium of the dentist, or in the introduction of analgesia instruction into the dental school curriculum, either on an undergraduate or postgraduate level.[45] At the time of this writing, analgesia instruction is offered in one dental school by the Department of Oral Diagnosis and Roentgenology.[46] It is suggested that the use of analgesia has been condemned because of the lack of training of men who attempted its use in the past with such poor results.[47] At one time, dentists permitted the manufacturers of gas machines to come into the dental office to teach the use of the machine. With no background or training in the chemistry, physiology or art of anesthesia; with no supervised clinical experience, failure and condemnation followed.[48] This failure rested squarely with the gas machine salesman and the dentist, not on the principles or technic of analgesia.[49] Unfortunately, condemnation was recorded in the literature and has been perpetuated through the years by many authors who have indicated no personal experience with the use of analgesia. Although there are enthusiastic reports in the literature concerning the use of nitrous oxide analgesia for adult operative dentistry, there are only several brief notes of its use in children's dentistry. In three standard texts on children's dentistry[50, 51, 52] there is only one which mentions nitrous oxide

analgesia. This text offers one sentence asserting that "the average young child does not have sufficient experience in comparable problems to coordinate or control the gas which is self-administered."[53]

It is felt that this field of pain control has been condemned and discarded by dentistry without proper investigation and study. On occasion, it becomes necessary to challenge, re-examine and re-evaluate undocumented statements which have been accepted as irrefutable fact for many years. This study was undertaken to test and evaluate this unexplored field of pain control in children's dentistry. Analgesia is not offered as a panacea, but as a valuable adjunct in pain control methods with easily demonstrable advantages to both patient and dentist.

Method

The study consisted of an evaluation of 14,632 administrations of nitrous-oxide-oxygen analgesia on 1,873 children from two to sixteen years of age. The number of administrations per child ranged from one to twenty five. Records were kept of each child who presented for dental treatment. Previous dental or anesthetic experiences were recorded and related to the child's behavior in this study.

Each child was urged to try analgesia for operative procedures. Those children who refused analgesia were given local anesthesia or no anesthesia, according to their request. When children requested a change in type of anesthesia, a record was made of this with the reason for the request.

Analgesia administration was considered successful if the dental procedures were efficient, painless and pleasant for both dentist and child. The number of successful and unsuccessful administrations was recorded, the reasons for failure being noted in each case. All problems and complications which occurred during analgesia were listed and evaluated.

In order to better understand and evaluate this study, the technic and results of analgesia for children, as used in this study, will be described.

Analgesia Technic

The term, analgesia, should be thoroughly understood throughout this paper. It should not be confused with any general anesthesia procedure, even though analgesia is described as the last phase of the first stage of anesthesia, before the second or excitement stage is reached.[54] Unless the state of analgesia has been experienced or seen, the feeling of pleasant, lethargic, numb euphoria is difficult to describe. It is to produce this stage of pain control that the technic of analgesia is directed. There is loss of sensibility to pain with little or no loss of consciousness.

The art of analgesia is similar to the art of anesthesia. Since analgesia is an early stage of anesthesia, training in general anesthesia is a prerequisite to the successful administration of analgesia. There has been an increasing emphasis in recent years on other than the purely mechanical or chemical application of anesthesia. The preparation of the patient with therapeutic drugs or psychological preparation plays a part in the modern administration of proper physiological anesthesia.[55, 56] To an even greater degree, this holds true for analgesia. Unless proper and complete preparation of the patient is made before analgesia is attempted, failure will almost certainly occur. Analgesia emphasizes the 'art' of anesthesia. The pre-induction instruction, induction and post-induction periods

are critical and without compromise in the importance of all other factors, aside from the actual administration of the gases.[57, 58]

1. *Pre-induction instruction.* This stage is important for both parent and child, and will make both more receptive to the idea of analgesia as a pain control method. At the initial examination appointment, the objectives and methods of dental treatment in the office are carefully outlined to the parent. Emphasis is placed on the fact that with understanding, gentleness and anesthesia (either local or analgesia), the child's dental experience will be made as pleasant as possible. The parent is told that with analgesia, the child will sense an experience of warmth, exhilaration and giddiness which is pleasant, and that work can then proceed with the child unaware of what is being done. It is important to stress that this is NOT general anesthesia and that the child will not be asleep.[59] The parent is requested not to discuss this with the child.

At the initial visit, when the hygienist does the prophylaxis and full mouth x-rays, she also prepares the child for the first operative appointment. The child is told about a 'peppermint air mask' or some other familiar term, and is then permitted to smell an unattached nosepiece to which has been added a few drops of essence of peppermint. While the child breathes the 'flavored air', a rubber polishing cup is touched to the tooth, and the child is told that the same thing will be done at the second visit. We want the child to anticipate, in a relaxed manner, the actual physical experience of the next visit, so that operative work by the dentist can proceed. This preliminary instruction by the hygienist takes less than a minute, but without it, the introduction of analgesia becomes very difficult at the operative visit. This is an essential step in the proper administration of analgesia.

2. *Induction.* No premedication is necessary for analgesia since the state of analgesia is soothing and relaxing in itself, and the percentage of oxygen is not disturbed enough to call for any premedication. No special directions are given regarding food or drink. At the first operative appointment, the nosepiece is placed with essence of peppermint on it, so that the visit is immediately related to the previous one with the hygienist. Before the nosepiece is placed, the flow of gases should be adjusted so there is almost an imperceptible flow. Any greater pressure will cause the gases to blow at the child's nose or eyes and frighten him. The decorum of the operating room and the attending dentist and dental assistant at this point are most important. The actual percentages of nitrous oxide may vary and become secondary to what is said and done to the patient. Even the actual plane of analgesia becomes less important than the techniques of positive suggestion and reassurance of the patient during induction.[60, 61]

The percentage of gases at the beginning of induction depends on many physiological variables, but may be approximated at 25 per cent nitrous oxide and 75 per cent oxygen. The patient controlled machine is not used. Partial rebreathing of gases may be desirable for carbon dioxide stimulation, where such a high percentage of oxygen is being administered; and to make economical use of the gases. Before the child begins to feel the subjective symptoms of analgesia, the dentist should describe the sensations in terms with which the child is familiar.[62] The tone of voice, speed of speaking and choice of words must be carefully controlled, so that the child will be able to

anticipate without fear, the previously unknown sensations of analgesia. These symptoms include uncontrolled thoughts and hallucinations, warmth, exhilaration, whirling, incoordination, feeling of lassitude and euphoria.[63, 64] This portion of the procedure is best demonstrated in a motion picture film produced by the writer. Here is where the art of analgesia plays its biggest part. Through the positive suggestion of pleasant reactions, and constant reassurance, the child is brought successfully to a stage of operative analgesia in approximately one minute.[65]

At this stage, the child is lethargic and responds to directed commands with a delayed response. Generally, the child will cooperate in opening the mouth. Sometimes a rubber bite block may be inserted. The child is told that a buzzing like an airplane (the drill) will be heard and that the tooth will be washed clean (water spray). The operative dentistry is then performed.[66, 67] In order to limit the amount of post-operative dizziness and minimize the possibility of nausea, procedures should be limited to less than ten minutes. With today's modern methods of performing operative dentistry swiftly and efficiently, cavity preparation becomes a matter of a very few minutes. With water spray, carbides, diamonds, and rotational speeds of 100,000 rpm's, the work should be completed with the same care and deliberation as are necessary with local anesthesia. Analgesia should be kept as light as possible during the procedures, and oxygen is usually added to the mixture as the work reaches its conclusion. As the nosepiece is removed, the child begins to enter a short post-induction period of analgesia during which deep sedative fillings or bases may be placed.

3. *Post-induction.* As the child recovers, care should be taken to keep him sitting still, as he may lunge forward in dizziness, or perhaps reach for a cup of rinse water and spill it. As the child comes out of the analgesic state, it is most important to suggest that he has experienced a pleasant sensation, had a nice dream and felt nothing. Even though the child may have winced or cried under a severe pain stimulus, it will be found that there is no memory of this experience. "In fact, these children find it rather amusing to get a "jag" from 20 per cent nitrous oxide and are perfectly willing to have cavities prepared while analgesic, but still conscious and cooperative. These patients have not lost their protective mechanisms of swallowing, expectorating and breathing. They do not have the accentuated harmful reflexes which lead to closure of the larynx or cardiac difficulties. They can maintain their position in the chair, and they get into difficulty only if the concentration is inadvertently raised to the point of producing the delirium of the second stage of anesthesia."[68]

Complete recovery from analgesia takes only a few minutes. By the time the amalgams are hard, the child is ready to leave the office. His only memory is that of the sensation of analgesia, and many children actually look forward to their dental appointments even though many cavities are prepared and filled at each visit.

Results

14,632 administrations of analgesia were given to 1873 children ranging from 2 to 16 years of age. Of the 14,632 administrations of analgesia, 14,539 were considered successful. These met the requirements of painless, pleasant dentistry for the child; and ease and convenience of operation for the dentist. These children returned to the office for subsequent work and asked to continue with

analgesia. Administrations for individual children ranged from one to twenty five.

The results of analgesia, as used in this study, were so successful and gratifying as to be dramatic. The common picture was that of a child beginning the administration of analgesia with a certain amount of fear, suspicion and apprehension. After approximately one or two minutes of induction, suggestion and persuasion, the child was in a languid, relaxed state, so that operative dentistry could proceed without incident. During the state of analgesia, the child responded to directions and requests, but with a delayed reaction time. Many children presented the almost unbelievable spectacle of laughing aloud at their dreams or hallucinations while having multiple cavities prepared. At post-induction questioning, these children only remembered that 'something was done' in their mouth, while they had a most pleasant dream. On rare occasions a child might cry aloud, or exhibit an involuntary reflex movement under a severe pain stimulus. Again, after analgesia was discontinued, these children had complete amnesia of the painful stimulus, or else remembered that they felt a particular tooth being worked on, but that it did not bother them.

The exhilaration, warmth and lassitude of analgesia prompted many requests for a second administration after the child recovered from the analgesia for operative dentistry. The child had to be reassured that analgesia would be used again at the next visit. Children were so enthusiastic in their appreciation of analgesia, that they referred children of their own age level, who came to the office and asked to have 'sweet air' to have their teeth fixed. Analgesia administration for this group of children who requested analgesia was uniformly swift, simple and successful.

Many dental procedures responded particularly well to analgesia which might have presented a problem, otherwise. These included incision and drainage of acute abscesses; seating crowns on hypersensitive teeth; vital pulpotomy; opening teeth with acute pulp involvement where the tooth is extremely sensitive to pressure; pericoronitis; to supplement local anesthesia when a tooth to be extracted has pericementitis involvement; and preparing cavities in all four quadrants of the arch at one visit.

A group of children (18) was referred to the writer for general anesthesia operative dentistry, since they required extensive operative and surgical procedures and had refused to have local anesthetic injections. These children were introduced to analgesia and had all of their dental work done at normal dental visits. Another group which was referred for general anesthesia, after several attempts at analgesia introduction, was included in our numerical summary of analgesia failures. These children had their dental work done in one appointment, with general anesthesia administered by the consultant medical anesthesiologist.

Of the 1873 children who tried the first administration of analgesia, 34 didn't like the physical sensation of analgesia and requested something else for the second visit. Of this group, local anesthesia was given to 30 at the second visit, and 12 of these requested to go back to analgesia for the remainder of their dental appointments.

At the first administration of analgesia, 6 children became nauseous to the point of vomiting in the office or later, at home. Two of them tried analgesia at a subsequent visit with no evidence of nausea. There were 28 other cases of nausea, which occurred in children who had from 3 to 15 previous successful ad-

ministrations of analgesia. Of this group, 20 refused to try analgesia again, and were given local anesthetic. Of the eight who tried analgesia again, only three were successful. The other five began to exhibit signs of pallor and nausea, so analgesia was immediately discontinued, and they suffered no ill effects.

Analgesia was discontinued for 16 other children because of signs of involuntary excitement and uncontrolled body movements. In these children, the threshold of analgesia and the excitement stage of anesthesia are so close as to make the use of successful analgesia impossible.[69] It must be remembered that minor involuntary flinching, crying or hand movements do not constitute failure. Without exception, the operative work proceeds successfully and the child has no memory of what has happened.

One of the most satisfying results of this study was the complete success and ease which accompanied routine extractions. Analgesia was administered for the injection of local anesthetic and the extraction procedure, so that the child had no discomfort or memory. In most instances, upon recovery from analgesia, the child did not believe that the surgical procedures were completed.[70, 71]

Number of Administrations per Child at Different Age Levels

Total Number of Administrations—14,632

Age	Administrations per child				
	0–5	5–10	10–15	15–20	20–25
2–5	480	975	1,243	300	123
5–10	986	1,504	2,740	502	250
10–15	942	1,875	1,910	620	182

Complications According to Age

Number of Children Given Analgesia—1,873
Number of Complications—100

	Age		
	2–5	5–10	10–15
Excitement	8	4	5
Refusals	13	14	22
Nausea	6	12	16

Complications According to Number of Administrations

Total Number of Administrations—14,632

	Number of Administrations				
	0–5	5–10	10–15	15–20	20–25
Excitement	6	8	3	0	0
Refusals	34	6	3	4	2
Nausea	6	4	12	7	5

Discussion

The most generally used method of pain control in children's dentistry is the use of local anesthesia, which may be readily adapted from familiar techniques in general dentistry. The use of a good topical anesthetic, sharp, fine gauge needles, and the rapid insertion into tautly held tissues help to make the use of local anesthesia acceptable to the child. However, in addition to occasionally unpleasant needle insertions, the persistence of anesthesia beyond the appointment time, with occasional lip biting or other post-operative discomfort, indicate some minor disadvantages with local anesthesia. The use of local anesthesia does not eliminate the frightening noises of cavity preparation, or the pressures and noises of surgical procedures with elevators or forceps. Local anesthesia is of little help in managing the frightened, emotionally unstable child and producing a relaxed cooperative patient.

Many dentists can perform services for children with little anesthesia of any sort. A psychotherapeutic approach is used with careful explanation of procedures and a gentleness of technique which includes water spray, diamond instru-

ments, carbide burs, small instruments, short appointments with the completion of one or two restorations. The writer feels that pain of varying degrees is inflicted on these children, even though they will permit the work to be done. It is the responsibility of the profession to do this work painlessly, and in as short a time as possible. Inflicting pain cannot be justified, and anesthesia is an aid which should be used. While it may be possible to complete dental work for many children without any anesthesia, this usually means a prolonged number of visits. "It is the objective in dentistry for children to accomplish a maximum amount of work in a minimum amount of time with the least degree of discomfort to the patients. . . .There is perhaps no easier way of losing the cooperation of an individual, be he child or adult, than to subject him to pain and discomfort for an extended period of time."[72] For these reasons, the writer feels that operative dentistry without any anesthesia does not fulfill the objectives of ideal dental treatment.

In some instances, the use of general anesthesia to provide a general dental service for children is advisable. Its use should be sharply restricted to those physically or mentally handicapped children for whom no other method of treatment will work. It should not be used by the dentist as a convenient method of completing extensive procedures. Every effort should be made to orient the child to normal dental procedures in a conventional manner. No matter how excellent the anesthesia staff and equipment, the element of inherent risk, though small, must be recognized and evaluated.

The same element of seriousness must be recognized in the use of heavy premedication techniques with narcotic, hypnotic or sedative drugs.[73, 74, 75] The method is not suitable to routine dental procedures and it is relatively inconsistent in its results. It involves bringing the child to the office in a semi-stupor, sedation in the office which is strong enough to produce a long lasting narcotic sleep so that the child has to be carried home. Since respiration, cough and gag reflexes are depressed, and the patient is sent home for a 24 to 48 hour recovery period with no medical or nursing supervision, there seems to be little merit in this method of pain control.

Another method of pain control, which has received much attention in the literature recently, is the use of trichlorethylene analgesia in a self-administered inhaler.[76, 77] This method of analgesia is not suitable for children because of the objectionable smell of the agent; a fairly long induction and recovery time; its self-administration and the lack of a controlled oxygen supply. The advocation of this method by the manufacturer to the general dentist with the implication that it is an 'easy' method with no training necessary, is to be condemned.

Analgesia, with the use of nitrous oxide and oxygen in a dentist-controlled analgesia or anesthesia machine, seems to have found no place in the literature of dentistry for children. Its use has been both lauded and condemned for adult analgesia, although the authors who have condemned nitrous oxide oxygen analgesia have never indicated the extent of their personal experience with it. The present writer has had the opportunity to observe and record in detail the results of 14,632 administrations of analgesia on 1873 children. These administrations were 99% successful and compared more than favorably with the use of local anesthesia. In addition to raising the pain threshold, analgesia created pleasant hallucinations or dreams, so that the child

loses the awareness of sounds and surroundings, and so completely loses the fear or apprehension of dentistry. The effects of analgesia disappear within five minutes so that there is no post-operative sensation as persists with local anesthesia for several hours. If used in proper analgesic dosages, nitrous oxide is exceedingly safe and may be used without the slightest danger. There have been no reported allergies or idiosyncrasies to nitrous oxide analgesia.

Conclusion

It has been demonstrated in this study that dentistry for children can be done efficiently, painlessly and thoroughly by the use of nitrous oxide-oxygen analgesia in combination with other pain control methods which have already been suggested. Some complications of analgesia which must be recognized, include nausea, excitability and fear of the physical sensation in a small percentage (1%) of administrations. In view of the many advantages of analgesia in the routine practice of dentistry for children, the writer believes that analgesia deserves a place in the armamentarium of any dentist who desires to handle children. The technic should receive further study in the dental school and by trained anesthesiologists. Those men who propose to administer analgesia, should be trained in general anesthesia with subsequent clinical experience in analgesia. This is necessary to properly administer analgesia and to be prepared for all problems and complications which might arise. With proper scientific background and training, it is a valuable technic and concept which can be mastered and used successfully by all dentists.

The following advantages of nitrous oxide-oxygen analgesia are demonstrable:

1. The administration of analgesia is pleasant and painless.[78]
2. Operative procedures proceed normally and easily in all or any quadrants of the mouth.[79]
3. Much work can be accomplished at each visit, thus shortening the length of dental treatment.[80]
4. Analgesia is effective with the fearful, emotionally unstable 'problem' child.
5. The child is relaxed and unapprehensive under the effects of analgesia.
6. The child is unaware of the details and procedures, and sometimes has no memory of what has been done for him.[81]
7. The child finds the experience of analgesia pleasant, and actually looks forward to his next appointment.[82, 83]
8. Analgesia is safe, with no allergies or idiosyncrasies.
9. Recovery is swift and uneventful by the time the child is ready to leave the office.

In addition to the many advantages, the writer recognizes that analgesia has certain drawbacks and limitations, as has any anesthetic or pain control method. This paper has endeavored to demonstrate that the current evidence places nitrous oxide-oxygen analgesia in a favorable light as a pain control method, and should indicate a need for further clinical study, instruction and evaluation. It is hoped that investigation by others will provide the stimulus for the inclusion of analgesia as a routine adjunct in pain control methods for dentistry for children.

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NOTICE

Charlie Oxar, 1957 Convention Coordinator, has received the following communication relative to convention expense deductions, from Laurie W. Tomlinson, U. S. Treasury Department, Internal Revenue Service, Jacksonville, Florida:

> "The test of the deductibility of business expenses is whether they are ordinary and necessary in the light of all the circumstances involved. Only to the extent, therefore, that the meeting in question is attended for business purposes with a reasonable expectation of deriving a business benefit will the individuals be entitled to a deduction under section 23 (a)(1)(A) of the Internal Revenue Code. Any expenses thus incurred which represent deductible traveling expenses may be taken into consideration in computing adjusted gross income.
>
> Expenses incurred for personal tours are, of course, not deductible."

Just another reason for you to join us in Miami Beach in November!

A.E.S.

Mouthpieces for the Handicapped

Dr. Robert R. Buckley, B.S., M.S., D.D.S.

It is estimated that there are 1,000 or more handicapped individuals in the State of Indiana alone who could profitably use a mouthpiece of some type to assist in the operation of electric wheelchairs, typewriters, and other devices.[1, 2, 3] Included in this group are patients with poliomyelitis, spinal nerve injuries, and cerebral palsy.[4, 5, 6, 7, 8] For many years attempts have been made to produce a mouthpiece which could be used with individuals lacking hand control. However, no device has been produced which could be considered uniformly successful or satisfactory because of the following reasons.[9]

1. Handicapped persons have been unable to retain a device in the mouth for long periods of time.

2. The devices were often difficult to clean resulting in unpleasant taste and odor.

3. Assistance was required to insert and withdraw mouthpiece.

4. A gagging sensation was often produced as a result of strain on the muscles of mastication.

5. Appliances were not stable due to poor retention and lateral movement in the mouth.

In addition there was no device formerly available designed to keep the tongue in the mouth which often results in feeding problems nor was one available that would prevent the patient from biting into a straw while drinking. Also, it has been shown[10, 11] that placing an object between the anterior teeth will result in eruption of posterior teeth and opening of the bite by as much as 3 to 10 mm. Therefore, it is axiomatic that a mouthpiece be constructed which covers all the teeth and that lies comfortably in the mouth when the mouth is in rest position.

Workers at the Cerebral Palsy Center and the School of Dentistry of Indiana University have been conducting studies over the past two years in an attempt to develop a device which would eliminate most of the undesirable properties of other mouthpieces. These studies had their origin chiefly with the athetoid cerebral palsy patients who because of their constant involuntary movements are unable to control conventional mouthpieces.[12]

Since a mouthpiece by virtue of its function involves the mouth and teeth, it follows that the services of a dentist are required. The purpose of this paper is to bring to the attention of the dentist, occupational and physical therapist a method of constructing such an appliance when the need arises. Occupational therapists routinely work with patients with motor nerve involvement and in the course of their treatments can determine if a mouthpiece will serve to increase the independence of the handicapped individual.[13]

The mouthpiece to be described is made of plastic (methyl methacrylate) and covers the clinical crowns of all the teeth. It has an anterior extension with a hole in the center to hold a straw or pencil. The construction of the appliance requires approximately three visits to the dentist.

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Technique

1. Alginate impressions of the patients upper and lower dental arches are taken along with a wax bite. Excellent impressions have been obtained without the use of general anesthetics or sedatives.[14]

2. Stone models of the teeth (Fig. 1) are prepared and mounted in centric relationship on an acceptable dental articulator. (Fig. 2)

3. Baseplate material is then adapted to cover the clinical crowns of the teeth in each arch extending the coverage onto the retromolar area. (Fig. 3) Since any undercuts will prevent easy withdrawal of the tray, the baseplate should be rather loosely adapted.

4. The two trays are waxed together into one solid piece building out the buccal contour to provide bulk. The lingual surface is concave to provide tongue room. Care must be taken not to raise the guide pin on the articular more than 1 or 2 mm. since the finished mouthpiece should encroach on the freeway space as little as possible. (Fig. 4) It should be possible to remove the mouthpiece from either arch without interference.

5. An anterior extension of solid wax is added to the mouthpiece and is directed downward at approximately a 45 degree angle. (Fig. 5) It should create a comfortable typing position with the head erect. The diameter of the extension should be reduced to permit nearly complete closure of the lips. The extension

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

FIG. 6

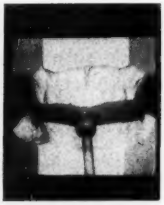

FIG. 7

may also be shortened considerably where a straw is used.

6. The wax model may be tried in the patient's mouth on the second visit to the dentist. It is sufficiently stable that the patient will not ordinarily damage it.

7. The wax model is invested in a denture flask from which the wax is eliminated. The mold is filled with heat-curing methyl methacrylate which is processed and removed from the flask.

8. The mouthpiece may be fitted after it is polished to a high luster. A hole is made in the extension with an acrylic bur of sufficient size to hold a pencil or the hole may be bored through the mouthpiece to accept a straw. (Fig. 6) The pencil and straw are held in position by frictional retention. (Fig. 7)

9. The dentist and occupational therapist should examine the mouth-piece frequently to detect areas of impingement that may be corrected to avoid injury to the teeth or supporting tissue. The patient is instructed to store the mouthpiece in water at night since drying of plastic produces distortions. Parents are asked to brush the patient's teeth after each meal.

DISCUSSION

The cerebral palsy clinic has tested this mouthpiece clinically for 24 months on six severely involved athetoid patients who are completely lacking in hand control, three of whom present tongue thrust feeding problems.

This mouthpiece has a number of advantages over other types. It is relatively stable in the mouth since the patient as he brings his teeth together causes the mouthpiece to assume the correct position everytime. Since it occupies the space between the teeth when the mouth is at rest, there is little or no gagging sensation, no strain on the muscles of mastication and the patient can relax without losing the mouthpiece. It is comfortable in the patient's mouth and can be used for long periods of time. The patients are able to remove and insert the appliance without assistance and can talk with some clarity while retaining the mouthpiece. Another advantage is that the individual can wet his lips with the mouthpiece in position. Also, there is no unpleasant taste, odor, or color since it is made of acrylic and for this reason can be easily kept clean with a denture brush.

The athetoid patient frequently has an open bite and severe tongue thrust and presents feeding and drinking problems. This mouthpiece has helped the individuals with tongue thrust to develop normal swallowing and breathing patterns, and has served as an aid in teaching normal positioning of the tongue.

One of the patients with severe tongue thrust and open bite, age 7 years, (Fig. 8) who had not learned to drink from any-

FIG. 8a

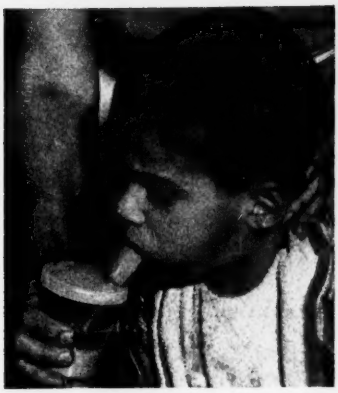

FIG. 8b

FIG. 9a

FIG 9b

thing had his drinking time, for 8 oz., reduced from one and one half hours to less than ten minutes, and was able to switch from this training aid to a plastic straw within a few days.

Another patient uses her mouthpiece to operate an electric wheelchair and typewriter. (Fig. 9) Improvement has been noted in head and neck control in all of the individuals studied and particularly among the three oldest patients who are able to use electric typewriters.

The importance of follow-up care by the dentist and the therapists as well as the parents cannot be overemphasized regarding mouth hygiene, tissue tolerance, comfort of the patient and undesirable side effects if any mouth piece is expected to be successful. This study has been limited to athetoid cerebral palsy

patients, however, the application and use of the mouthpiece can be extended to include other individuals who are unable to use their hands.

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Unit News

As deadline time approached for this issue of the Journal of the A. S. D. C., this editor found only eleven Units had taken the time to submit reports of their activities during the last quarter. It hardly seems possible that so few of our component groups could be doing things of interest. Rather, it seems more likely that a large number of our various groups throughout the country must be doing things and participating in activities that would make interesting reading for the rest of the members.

The responsibility for gathering this news is two-fold—first, it is up to the Unit News editor, and, second, it is up to the officers and, specifically, the secretaries or editors of the respective Units. We are now in the process of assembling a complete and up-to-date roster of the current officers of the various Units of the A. S. D. C. Henceforth, letters will be sent to the respective Units ahead of the deadline dates asking them to see to it that notices of their activities are submitted to the Unit News editor.

Once again we request the responsible people in the separate Units to see to it that their activities are publicized in our Journal. With so many groups spread throughout the length and breadth of the land, it is helpful to all of us to see what type of functions are being held by our confreres. One of the big advantages of this exchange of ideas is that it will afford all of us an opportunity to institute in our own communities programs, both for the general public and for ourselves, that could be put to excellent use. What is good for you, may be good for us. But if we don't know about what you are doing, how can we try it ourselves? Therefore, spread the news and let us all in on your activities.

Arkansas

J. R. Luten, Jr., of Little Rock was elected president of the Arkansas Unit to serve for the coming year. His fellow officers are E. H. Dildy of Hot Springs, vice-president, and R. L. Smith, Jr. of Little Rock, secretary-treasurer. In addition to these officers, the following men were named to the executive council: Ralph Bowers, Horace Beeme, W. L. Cloud, Haile Bowers, and Basil Gibbs.

During the Arkansas State Dental Association Meeting held in April, twenty table clinics were presented. Just to prove that our boys out there are really active, *half* of that number were given by A. S. D. C. members on the subject of pedodontics!

Plans are already underway for the fall seminar which will be held in Hot Springs, Arkansas, on October 27. Everyone is invited.

Northern California

October 18th will be a banner day for the Northern California Unit. Its second annual post-graduate seminar will be held at the St. Francis Hotel in San Francisco.

Dr. Ralph Steinman from the faculty of the Dental School of Medical Evangelists at Loma Linda will present his own research paper on the control of dental caries through proper infants' formula. The second speaker is to be Dr. William P. Humphrey of Denver, Colorado, who is well-known for his work with the Rocky Mountain stainless steel

crown and, of course, will speak on that very same subject.

Following these scientific sessions, Dr. Al Anderson, who, according to Bob Burleigh, is San Diego's answer to Bob Hope, will speak at the luncheon meeting. If his subject matter is half as interesting as its title, Dr. Anderson will be a smash hit! His title is "Katchina, Yabacci, and Muddy Roads." Wow! The day will wind up with a dutch treat cocktail party.

This same group held its May meeting in San Rafael. Craig Woolman of Walnut Creek explained some of the values of hypnotism and its uses in medical and dental cases.

A special nod of the typewriter has to go to Robert Burleigh who is particularly prompt in sending in reports about his Unit, which certainly makes this job easier.

Georgia

The Georgia Unit really went all out this year with its annual pedodontic seminar. The two day clinic in September featured a child psychologist from Atlanta and a team of orthodontists from Canada. Dr. Al Agrin discussed in a most interesting manner several of the psychiatric complexes and problems concerning the child as a patient in the dental office. This particular facet of dentistry, the psychology of the child as a patient, seems to be coming to the front more and more, and interest in the subject was quite obvious in light of the many intelligent and provocative questions that were presented by the audience to the speaker.

The orthodontic team from Canada consisted of six men headed by Dr. Peter Curie, of London, Ontario. The main subject these gentlemen discussed was that of interceptive orthodontics in the hands of the pedodontist and the general practitioner. The entire program was directed to the general practitioner as well as the specialist.

Attendance was better than had been anticipated, and this group really is on the move. Much of the credit for the success of this program must go to Mary Lynn Morgan, who is an indefatigable secretary.

Idaho

Almost *one-fourth* of the dentists in Idaho are now members of the Idaho Unit of the A. S. D. C. This is really a terrific accomplishment and one of which the members can feel justly proud. Vernon Nord and Wesley O. Young combined efforts to send in this quarter's report.

The Idaho Unit held its second annual meeting in Pocatello, Idaho, in May. Dr. Earl Lampshire of the University of Nebraska Dental School was the featured speaker at the one day meeting. The following members were elected to serve as officers for the coming year: President, Richard Hagerman; President-elect, Dale Ablin; Vice-president, Rex Hall; Secretary-treasurer, Wesley O. Young; Editor, Jack Mauk.

Missouri

The Unit in the "show-me" state has a great idea. They plan an annual meeting at which time the senior classes of both St. Louis University and Washington Dental Schools are invited attend as their guests. This year's meeting was held in April and featured a panel discussion on "Practice Administration in Pedodontics." Earl Dean was the moderator, and Margaret Toalsen, Jack Gilster, and John Harland served on the panel.

New officers were elected in May at a meeting held in conjunction with the Missouri State Meeting. These new officials are: Leonard Rosen, president; Neal Newton, vice-president; Edward

Brungard, secretary-treasurer; and Roger Parrott, corresponding secretary.

The fellows out there are quite ambitious and have set a goal of 200 members. They must be on the right track because during the past year their membership increased from 117 to 162. Nice going, gentlemen—and keep up the good work!

Neal Newton (who says he can't type but submitted a fine report anyway) says that Ruth Martin is now living in California; her address is 126 West Calle Crespis, Apt. #3, Santa Barbara, California. Neal says she has always been a guiding light to their Unit, and he passes on the information in case some of her friends in the A. S. D. C. would like to drop her a line since she has been in ill health for some time.

And Neal, don't worry about your typing—just send the copy. We'll decipher it!

Western Pennsylvania

"Child Development" was the subject of Dr. Margaret McFarland at the June meeting of the Western Pennsylvania Unit of the A. S. D. C. Dr. McFarland is an associate professor of psychology at the School of Medicine of the University of Pittsburgh. Also on the program was Mrs. Genevieve Foster who is coordinator of in-patient service at the child guidance clinic. Mrs. Foster elaborated on the same theme, i.e. Child Development. Here again we see interest being directed towards that all-important subject of the psychology and development of the child as a dental patient.

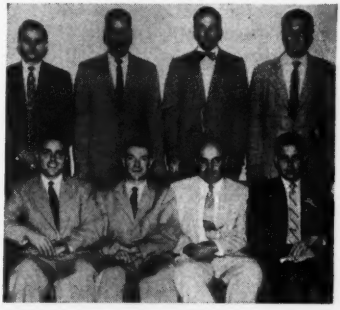
Rhode Island

The annual clinic day meeting of the Rhode Island Unit was held in May of this year at the Joseph Samuels Clinic in Providence. These fellows really present an ambitious program with all sorts of subjects being discussed. They ran the gamut of everything from "Surgical Exposure and Repositioning of an Unerupted, Malposed, Permanent Tooth" to "Pedodontic Roentgenology." It would take almost a book to list all of the qualifications of their clinicians, but here, at least, are their names: Drs. Neville Booth, Charles Boyers, Janice Feinberg, Daniel J. Holland, Mihoru Horiuchi, Paul K. Losch, John A. MacLaughlin, Julian Rothblatt, and Ismail Yazdi. Now there's a list of clinicians!

As might be expected, a most worthwhile day was spent by all those who attended.

Ohio

Omitted from our 2nd Quarter News, was the accompanying picture from the newly formed Dayton Study Group of our Ohio Unit.



Standing, from left to right are the newly elected officers: Eugene Huffman, Secretary; Roger Kuhn, Treasurer; Paul Starkey, President; Robert Doench, Vice-president.

Seated are four distinguished guests from Columbus: Allen Hall, Everett Tracy, Lyle Pettit and William Maddox.

Tennessee

The Tennessee Unit met May 13th in the beautiful mountain city of Gatlingburg, Tennessee. It was the first time the city had been host, and retiring president Ed Coleman reports, "We had the pleasure of a brand new auditorium as well as the 'mountain dew'!"

Dr. Frank F. Lamons and Dr. Mary Lynn Morgan of Atlanta, Georgia presented a symposium on "Effective Pulp Therapy for First Grade School Children."

The Unit has now reached a new high in membership with well over eighty. Officers elected at the business meeting were: President, Robert E. Pope; President-elect, B. F. Gunter; and Secretary-treasurer, Paul O. Young.

Congratulations on the membership increase and the fine report!

North Carolina

The Tarheels held their annual pedodontic seminar in April at the dental school in Chapel Hill. Dr. Robert Nelson of the U.N.C. School of Dentistry discussed "Preventive Orthodontics for the General Practitioner" during the morning session. In the afternoon, Dr. Roy M. Wolff, of Clayton, Missouri, discussed the child's first visit to the dentist, office procedures and the handling of children and education of the parent as well as the child in the field of pedodontics. Dr. Wolff is in charge of the dental clinic at Cardinal Glennon Hospital for Children in St. Louis. Newly elected officers for the North Carolina Unit are: Freeman Slaughter, president; Donald Henson, president-elect; Kimball Griffin, vice-president; and Roy Lindahl, secretary-treasurer.

Wisconsin

Spring may be long gone, but the Wisconsin Unit heard Dr. Clyde L. Stroup speak on "This Business of Children's Dentistry" in April (and it's still news!) at the Hotel Schroeder in Milwaukee. Al Seyler, our esteemed editor, was a guest at this particular meeting.

The Unit elected officers at this time, and they are as follows: C. A. Frey, president; Wayne Newby, president-elect; Leland Crosby, vice-president; O. E. Minshall, secretary-treasurer; and Fred Druse, council member for three years.

Their next meeting is to be held the early part of October in Waukesha at the Moore Hotel, but details were not available at press time.

Unit members in Wisconsin apparently are anxious to keep moving because they now total 130 members, and as correspondent Minshall says, "We're still growing." That's the spirit, and keep up the good work!

Overseas

This time we have four reports from groups or organizations away from the continental United States. It is most interesting to learn that men elsewhere throughout the world are interested in the same things that concern practitioners here in the States.

Belgium

The first report I have received from Europe comes from Dr. Paul Biot in Brussels. He reports in February of this year the orthodontists in Belgium formed a new society dedicated to Dento-Facial problems. He is the permanent secretary and, for those who might be interested, his address is 8, Rue de Livourne, Brussels.

Hawaii

Honolulu was the scene of much activity during the ninth National Dental

Health Week observed in the territory of Hawaii. Activities actually began when Mayor Neal Blaisdell officially proclaimed the ninth National Health Week. Adequate posters, radio spot announcements, and publicity of all sorts were disseminated to the general public in Hawaii.

Highlight of the Dental Health Week was a poster contest which was open to all Oahu youngsters in the fourth, fifth and sixth grades. The astounding total of 720 entries was received. Appropriate prizes were awarded to the winners who were selected by an art professor, an advertising man, and a dentist. Congratulations on this fine program.

Israel

Dentistry for children knows no territorial limits.

Word has recently been received of the formation of the Israel Society of Dentistry for Children. As is true with most fledgling groups, the I. S. D. C. is seeking guidance and assistance.

Dr. Aga Spitz, Director of the Orthodontic Department of the Department of Health in Israel, and author of several articles which have appeared in this country in the *Journal of Orthodontics*, is a charter member and board member of this new society. She has been in contact with Dr. Sylvia Zappler of New York, and Dr. Zappler has forwarded to Israel a considerable amount of educational material already. (Incidentally, Dr. Zappler was made the first honorary member of the new society.)

A dental Congress was held in April in Israel, and a special department for information called "Dental Treatment for Children Through the World" was established. Both Doctors Spitz and Zappler have requested additional material of an educational nature (pamphlets, charts, pictures, models, etc.). These—or other items—may be sent either direct to Israel or to Dr. Zappler, who will forward them. The addresses are:

Dr. Aga Spitz
Israel Society of Dentistry for Children
Health Centre, Nathan Strauss
Tel-Aviv 14, Balfour Street
Tel-Aviv, Israel

Dr. Sylvia E. Zappler
25 Central Park West
New York 23, N. Y.

Pan American Council of Dentistry for Children

The first Pan American Congress of Dentistry for Children, which was to have been held in Havana immediately following this year's A.D.A. meeting, has been postponed until next year. Dr. A. Montero, secretary, reports this action was taken because of reasons beyond their control. The meeting of the council itself, which was also planned for Havana, has now been transferred to Miami Beach, the Balmoral Hotel, on Monday, November 4th, immediately after the A. S. D. C. meeting.

A Spanish transcription of Dr. Samuel D. Harris' book was recently published in the Journal of the Cuban Society of Dentistry for Children.

In El Salvador, Dr. Batista Mena reports that the first fluoridation plant in Santa Ana has been opened.

From Costa Rica comes word that Dr. Raymond Pauly, head of the department of pedodontics at the Dental School of the University of Costa Rica, has published a new book entitled "Children's Dentistry," and from Mexico, Dr. Maria E. Castro reports that Dr. Samuel Leyt presented a post-graduate course in February.

Announcements

The Medical College of Virginia, School of Dentistry, offers a two-year post-graduate program leading to a certificate

in pedodontics. The curriculum includes every phase of dentistry for children, even to the extent of hospital dental care. Its primary purpose is "to help those practitioners who have a desire to become proficient in the practice of pedodontics."

Complete details about this course may be secured from Dr. H. T. Knighton, Director, Graduate and Post-graduate Instruction, Medical College of Virginia School of Dentistry, Richmond, Virginia.

The College of Dentistry of Ohio State University will present a post-graduate course in pedodontics from March 3rd to March 7th, 1958. The course will be conducted by Dr. Lyle S. Pettit and Dr. Benjamin H. Williams. Enrollment is limited to approximately ten per class and the tuition fee is $50.00 for the course. Complete details may be secured from the Post-graduate Division, College of Dentistry, Ohio State University, Columbus 10, Ohio.

Material intended for Unit News should be sent to Ted Levitas, 340 Boulevard N.E., Atlanta 12, Georgia. Dead line dates are: 4th Q, September 15; 1st Q, January 1; 2nd Q, March 15; 3rd Q, July 1.

Florida—1957

Dr. Charles Oxar, Convention Coordinator for our 1957 Meeting has sent us the following information for use by our members during their visit to Florida. It is intended as a guide for your activities away from the convention meetings, and lists places to go and things to see.

A.E.S.

STORYLAND—on highway US 1 North of Fort Lauderdale at Pompano Beach. Land of make-believe. Ponies, Ferris Wheel, Merry-Go-Round, Space Chaser. Dine at the Gingerbread House! 11 acres of full-sized, vividly colored reproductions of Fairy Tale Castle, Peter Punkin-Eater's Pumpkin, The Three Bears' House with Goldilocks, Jonah and the Whale, Cinderella and her Magic Coach, and etc. Sport car racers, miniature train tours, imported derby sulkies.

CYPRESS KNEE MUSEUM (Tom Gaskins')—on Fisheating Creek and highway US 27 at Palmdale. See cypress knees growing in a cypress swamp. See the largest cypress tree ever to be transplanted, it weighs over 12,000 pounds and cost $1200.00 to move. See cypress knee lamps etc. being made.

SARASOTA—Lido Beach Casino is three miles from Sarasota. Enjoy complete bathing facilities, no admission charge. See the Red Sox train at Payne Park! Visit Myakka River State Park—Florida's largest. Visit the John and Mable Ringling Museum of Art. Buy art works at the Sarasota Art Association. Visit Sarasota's Jungle Gardens. See the Winter home of the Ringling Circus. See the Palm Tree Playhouse, the country's first professional (Equity) stock company to perform on Tudor staging. See the Circus Hall of Fame. Visit Horn's Cars of Yesterday Museum, outstanding collection of antique automobiles. Visit the Reptile Farm and Zoo. Visit the Glass Blowing Studio. Sarasota is 50 miles South of Tampa on US highways 301 and 41.

SEA AQUARIUM—on Miami's fabulous Rickenbacker Causeway. 750 foot shark channel is world's largest, teeming with man eaters! See divers match wits with monster fish at feeding time. All types of salt water fish. Open 9 AM to 5:30 PM daily.

AIR TOURS OVER MIAMI AND MIAMI BEACH—Spend twenty happy minutes floating safely over America's colorful Winter Playground! Get a bird's eye view of the main points of interest from the Goodyear helium-inflated airship. Flights from MacArthur Causeway. Daily except Sunday. $5.00 per adult passenger, $2.50 for children.

AQUAFAIR PANORAMA—184th Street and Biscayne Blvd. Routine and novelty swim acts, shows, etc. See a horse dive (or belly flop) from a high diving tower.

ORCHID JUNGLE—World's largest outdoor orchid garden. Every lady gets an orchid! On highway US 1, 25 miles South of Miami in Homestead.

SPANISH MONASTERY—in North Miami Beach at 167th Street and West Dixie highway. Erected in 1141 AD in Spain and brought to America by William Randolph Hearst. Open daily 10 AM to 5:30 PM. Admission charge.

VILLA VIZCAYA—located in the old Deering Estate on South Miami Avenue on way to Dinner Key Auditorium. Dade County Art Museum. Venetian gardens, canals, palace, etc. Admission charge.

AFRICA, USA—on highway US 1 near Boca Raton (North of Miami). A large area in which African animals may be seen in a natural setting very similar to their own original habitat.

KEY WEST—165 miles South of Miami. 90 miles from Cuba! Drive on a highway where the nearest land is miles and miles away (Seven Mile Bridge). Atlantic Ocean and Gulf of Mexico meet under your wheels! See Truman's "little White House," U. S. Naval Base, E. Hemingway's home, old Fort Taylor! A short boat ride will take you to old Fort on Dry Tortuga where Dr. Mudd was imprisoned during Civil War for setting John Wilks Booth's leg—it is now a bird sanctuary.

GULFSTREAM PARK—on highway US 1 in Hallandale, just North of Miami. Horse racing. Season begins when Hialeah Race Track's terminates. A beautiful all metal structure surrounded by a tropical landscaping.

HIALEAH RACE COURSE—in Hialeah, a suburb-like municipality just West of Miami. A world renown track to which no introduction is needed.

Hialeah Speedway—in Hialeah. Auto racing. Spills. Thrills, etc.

Miami Beach Kennel Club—on South Collins Avenue. Overlooks Ocean, near Government Cut. Greyhound racing.

Biscayne Kennel Club –greyhound racing.

JAMES MELTON AUTORAMA—on highway US 1 at Hypoluxo. Ancient means of mechanical transportation. Old fire trucks. Old cars. Old bikes.

CHIMPANZEE FARM—on highway US 1 in Dania, just North of Miami.

STEPHEN FOSTER MEMORIAL—White Springs, Florida.

For Mexican and Spanish cuisine—
don julio's
136 N. E. 20th Street
Full course dinners from $1.75 up.

For Danish foods—
Beef and Bird
1111 Dade Boulevard
(just East of Alton Road)
Dinners $3.95

For French cuisine—
Maxim's
9516 Harding Avenue

For German cuisine—
Old Heidelberg
Federal Highway US 1 in Hallandale
Two wonderful shows nitely

Luau—79th Street Causeway (71st Street on the Beach side). A south-seas atmosphere. Open 5 PM to 2 AM. The antic arts of Alohaland blended with the culinary capers of the Cantonese.

BAKER'S HAULOVER—(Collins Ave. at Baker's Haulover Cut, just north of Miami Beach). A popular fishing pier. Boats for Gulf Stream fishing.

BAY FRONT PARK—(Biscayne Boulevard, between S. E. 2nd Street and N. E. 5th Street). A forty acre tract overlooking Biscayne Bay. Constructed of filled-in earth, this beautifully landscaped park is a major Miami attraction. Of special interest is the Amphitheatre where Mayor Anton J. Cermak of Chicago was assasinated in 1933 while in the company of President-elect Franklin D. Roosevelt. North of the park is the Municipal Yacht Basin for private and for-hire fishing boats. The Public Library is also located here.

BISCAYNE FRONTON—(3500 N. W. 35th Avenue). The Basque Jai Alai matches are played here nightly during the season. Admission fee.

CAMPANILE—(Alton Road & North Bay Road, Miami Beach). This bell tower was donated to St. Patrick's Roman Catholic Church by the late Carl G. Fisher. The chimes were brought over from Cuba.

DADE COUNTY COURT HOUSE—(West Flagler Street & N. W. 1st Ave.). Built in 1928 at a cost of $4,062,779.00. Tallest building on Miami's skyline, a 28-story structure. An "escape-proof" county jail fills the top-most floors. That view is for the birds!!

LINCOLN ROAD—The little "Fifth Avenue" of Miami Beach, a street lined with smart shops, most of which are branches of New York and Paris establishments.

LUMMUS PARK—(North River Drive, N. W. 3rd Avenue & N. W. 2nd Street). Here is Fort Dallas, built during the Seminole War in 1835. It originally stood on the waterfront. This park must not be confused with the Lummus Park on Miami Beach.

UNIVERSITY OF MIAMI—(University Drive & Le Jeune Road, Coral Gables). Third largest educational institution in Florida. Notes for courses in Latin-American subjects, Liberal Arts, Education, Business Administration, Music, Law, Aviation and Medicine.

CHURCHES

EPISCOPAL CHURCH

All Souls Episcopal Church, 4023 Pine Tree Drive, JE 82244, Rev. J. M. Taylor.

JEWISH SYNAGOGUES—

Agudath Israel Hebrew Inst., 7801 Caryl Avenue, Rabbi Dr. Hirsh Ever, UN 65226.

Beth Israel Congregation, 711 40th Street, JE 81251, Rabbi H. Louis Rottman.

Beth Jacob Congregation, 311 Washington Avenue, JE 16150.

Beth Tfilah Congregation, 935 Euclid Avenue, JE 81521.

Kneseth Israel Congregation, 1415 Euclid Avenue, JE 82741.

North Shore Jewish Center, 620 75th Street, UN 60221, Rabbi Mayer Abramowitz.

North Shore Jewish Center Religious School, 620 75th Street, UN 62156.

Sephardic Jewish Congregation Beth-El of Greater Miami, Inc., 715 Washington Avenue, JE 19441.

Temple Beth Sholom, 4144 Chase Avenue, JE 87231, Rabbi Leon Kronish.

Temple Emanu-El, 1701 Washington Avenue, JE 82503, Rabbi Irving Lebrman.

Torah Temple, 1254 West Avenue, JE 19948, Rabbi Louis A. Cassel.

METHODIST CHURCHES—

Miami Beach First Methodist Church, 4760 Pine Tree Drive, JE 17166, Rev. Jos. R. Crawley.

St. John's on The Lake Methodist Church, 4760 Pine Tree Drive, JE 17166, Rev. Jos. R. Crawley.

ORTHODOX CHURCH—

Holy Trinity Romanian Orthodox Church, 1869 N. E. 181st Street, North Miami Beach, WI 71581, Very Rev. Father Alexander Bogioaca.

PRESBYTERIAN CHURCH—

Miami Beach Independent Presbyterian Church, 7141 Indian Creek Drive, UN 52353, Rev. Willis E. Garett.

CHRISTIAN SCIENCE PRACTITIONERS—

Mrs. Gertrude Duke, 350 Lincoln Road, JE 88507

Mr. Louis Duke, 350 Lincoln Road, JE 88507

Mable Reed Hyzer, CBS, 1 Lincoln Road, JE 87753

BAPTIST CHURCH—

Miami Beach Baptist Church, 2816 Sheridan Avenue, JE 83507, Rev. W. Maurice Fain—Pastor.

CATHOLIC CHURCHES—

St. Francis DeSales, 6th Street at Lenox Avenue.

St. Joseph's Catholic Rectory, 8670 Byron Avenue, UN 65269, Rev. George Rockett.

St. Patrick's, 37th Street and Alton Road.

CHRISTIAN SCIENCE CHURCHES—

Reading Room, 9511 Harding Avenue, Surfside, UN 60070.

Reading Room, 937 Lincoln Road, MB, JE 83504.

First Church of Christ Scientist of Miami Beach, 1920 Alton Road, JE 83506.

COMMUNITY CHURCH—

Church-by-the-sea, 501 96th Street, Bal Harbour, UN 60321.

Dial-A-Prayer, 501 96th Street, Bal-Hbr, UN 52621

Miami Beach Community Church, 1620 Drexel Avenue, JE 84511, Rev. R. Wiley Scott—Pastor.

Those who plan to come by train will save time, money and nerve strain if they get off the train at the *North Miami FEC Depot* instead of going all the way downtown. It was built last year and is about five (5) minutes drive from the Balmoral over the Broad Causeway (125th Street).

Minutes of the Executive Council Meeting and the General Business Meeting of the American Society of Dentistry for Children

September 28 and 29, 1956
Ambassador Hotel, Atlantic City, New Jersey

NOTE: These minutes have been briefed to present highlights that will be of general interest and importance to the membership. The complete minutes are kept on file by the Secretary.

MINUTES OF THE EXECUTIVE COUNCIL MEETING

IN attendance at this meeting were President Henry M. Wilbur, President-elect Lawrence R. Burdge, Vice-President Albert L. Anderson, Editor Alfred E. Seyler, and Secretary-Treasurer William E. Brown. Executive Council members in attendance were: Harold K. Addelston, Willard T. Hunnicutt, C. Frank Tuma, Hugh Keenan and Charles A. Sweet, Jr. In addition to these officers, present were the following committee chairmen: Paul M. Weber, George J. Higue, Arthur M. Mickler, Charles Oxar, Pat H. Lyddan and Harold Berk.

Mr. Perry Sandell, Director of the Bureau of Dental Health Education of the American Dental Association, presented a new format for the pamphlet, "Pointers for Parents." This educational pamphlet was published several years ago for the American Society of Dentistry for Children in order to help prepare parents for their children's first visit to the dentist. Since the original publishers have gone into bankruptcy, copies of the pamphlet are no longer available. Because of this the American Dental Association is undertaking the task of revising and publishing the pamphlet. President Wilbur suggested that the Public Relations and Publicity Committee work with Mr. Sandell to develop a new pamphlet which would be acceptable to both the American Society of Dentistry for Children and the American Dental Association.

After the report of the American Board of Pedodontics was presented, it was moved by Dr. Sweet and seconded by Dr. Anderson that the A.S.D.C. subsidize the Board with $1,000.00 for the fiscal year ending October 1957, in order to assist in financing the activities of the Board. With a yearly subsidy the Board would be able to conduct an examination each year even though there might be as few as 10 applicants, and it would be able to maintain a permanent executive secretary. The motion carried.

Professional Relations Committee Report

Dr. Pat H. Lyddan, Chairman of this Committee, reported that he had contacted Dr. Einar Christopherson, Executive Secretary of the American Academy of Pediatrics, in order to establish a better liaison between the two groups. He reported further that Dr. Christopherson was most willing to meet with representatives of the A.S.D.C. in order to discuss methods to further this program. Dr. Lyddan urged a meeting with Dr. Christopherson to work out the details of the program.

Schools and Dental Boards Committee Report

Dr. Arthur M. Mickler, Chairman of this Committee, reported that their project is to assemble a list of questions and answers to be submitted to all boards of dental examiners and teachers of pedodontics, with the desire that the questions be utilized in examinations. The Committee felt that a tactful letter should be written to all boards of dental examiners informing them of the questions and answers now available and urging their use.

Community Dental Health Programs Committee Report

Dr. Harold Berk, Chairman of this Committee, recommended that (1) A.S.D.C. should continue its past policies of promoting preventive dentistry whenever and wherever possible, (2) A.S.D.C. should cooperate with the new Committee to Protect Our Children's Teeth, Inc., headed by Dr. Benjamin Spock, and with all organizations interested in children with handicaps, (3) A.S.D.C. should cooperate closely with the American Academy for the Rehabilitation of Crippled and Handicapped Persons and work with it to institute community dental programs for handicapped children.

Membership and State Units Committee Report

Dr. Lawrence R. Burdge, Chairman of this Committee, announced the formation of a new State Unit in Idaho. This Unit organized a charter membership of 37 from a total state dentist population of only 250. The results of a questionnaire sent to all State Units by this Committee indicated (1) a static membership with need for a more aggressive membership drive, (2) that 17 State Units lack a well-defined program, (3) that 6 State Units have a publication of their own, (4) that the National meetings meet with the approval of the membership, (5) that the membership is critical of the tardiness of the Journal. The Committee recommended that the members of the Executive Council either compose or augment the Membership and State Units Committee. Thereby, in their official capacity Executive Council members could more effectively aid the State Units to solve their problems.

Auditing Committee Report

Dr. George Higue, Chairman of this Committee, reported that A.S.D.C.'s books were audited by Wooden, Benson, and Walton, certified public accountants of Baltimore, Maryland. The audit covered the period of January 1 to August 31, 1956. The present net worth of A.S.D.C. is $19,263.00. This represents a net gain of $7,386.55 of income over expense for the period. The Committee stated that the audit was not adequate since it covered only an 8-month period. It suggested that in the future each audit should cover a fiscal year and should include comparative abstracts for a three-year period so as to provide a basis for comparative evaluation.

Secretary-Treasurer's Reports

The Secretary William E. Brown reported that as of September 25, 1956, 17 State Units had failed to respond to the call for delegates to the Annual Meeting. He suggested that in the future the response might be better if the requests for delegates were mailed in the spring before vacation time. He also suggested that an improved relationship between the A.S.D.C. and State Units might be established if a brief news letter were sent out periodically to Unit Secretaries to fill in the gaps between issues of the Journal.

President's Report

President Wilbur recommended that (1) steps be taken immediately to set up the Annual Meetings of the A.S.D.C. five years in advance, and that as soon as possible, appointments be made of chairmen in the various cities chosen for the Annual Meetings, (2) State Units be apprised of the seriousness of their not informing the Business Manager and the Secretary as soon as they have a change in officers, (3) the matter of an Executive Secretary be resolved during the coming year with a thorough investigation regarding cost and usefulness, (4) if an Executive Secretary is employed, he might have central offices in Detroit in order to better assist the Editor in matters concerning the Journal, (5) as soon after this meeting as practicable, the Constitution and By-laws be published with the revisions made last year and this year, (6) all annual reports should be given to the Editor first, for publication of those parts of the reports containing recommendations for the coming year. After use by the Editor, the reports should be sent to the Secretary where a copy should be made and sent to the person appointed by the new president as chairman of each committee.

Dr. Anderson moved that Dr. Alfred E. Seyler be reappointed Editor of the Journal. Dr. Sweet seconded the motion which was passed unanimously.

Minutes of the General Business Meeting

I. *Reference Committee Reports*

A. *Membership and State Units Committee*

The Reference Committee recommended that, (1) an information program should be established between the American Society of Dentistry for Children and State Units to provide better liaison, and that (2) a manual should be prepared to instruct State Units on the methods for managing membership dues.

Albert L. Anderson
C. Frank Tuma
W. E. Brown, *Chairman*

B. *Professional Relations Committee*

The Reference Committee suggested that there be a better liaison between the American Society of Dentistry for Children and the American Academy of Pediatrics. The Committee indicated that the potential is great for both organizations to give impetus to the education of both dentistry and medicine as well as to correct some common misconceptions present in both groups that have produced confusion among the lay public. It was further recommended that Mr. Perry Sandell, Director of the Bureau of Dental Health Education of the American Dental Association, be included in any conferences between the two groups.

Willard T. Hunnicutt
Harold K. Addelston, *Chairman*

C. *Schools and Dental Boards Committee*

The Reference Committee suggested that members of each State Unit should be asked to call upon members of their state boards of dental examiners to further interest them in the use of the questions that have been formulated for examination purposes. In addition it was suggested that old questions be revised to keep pace with more recent scientific investigations.

Charles A. Sweet, Jr.
Harold K. Addelston, *Chairman*

D. *Community Dental Programs Committee*

The Reference Committee indicated that past policies be continued with

broader amplifications and that the A.S.D.C. cooperate with the Academy for the Rehabilitation of Handicapped Persons and work with it in instituting community dental programs for handicapped children. In addition, it was suggested that the President of the A.S.D.C. write to Dr. Benjamin Spock, Chairman of the "Committee to Protect Our Children's Teeth, Inc." and offer support for their endeavors. It was further suggested that this Committee's full report be sent to State Unit Secretaries.

WILLARD T. HUNNICUTT
C. FRANK TUMA, *Chairman*

E. *American Board of Pedodontics*

Since the American Board of Pedodontics is an instrument of the American Society of Dentistry for Children, since its funds are actually our funds, and since it is surpassed by no other examining board in dentistry, and does such an outstanding service for our Society, the Reference Committee wholeheartedly supports the action taken by the Executive Council to provide any and all financial assistance to the American Board of Pedodontics when it is requested.

LAWRENCE R. BURDGE
W. E. BROWN, *Chairman*

F. *Secretary-Treasurer Recommendations*

The Reference Committee urged that State Unit Secretaries respond promptly to the inquiries of the National Secretary so that greater efficiency might be obtained. It supported the Secretary's suggestion that a periodic brief News Letter be sent to all State Unit Secretaries between issues of the Journal to keep them abreast of the latest developments on the national level.

C. FRANK TUMA
CHARLES A. SWEET, JR., *Chairman*

G. *President's Recommendations*

The Committee approved the following suggestions of the President:

1. The immediate appointment at the 1956 Annual Meeting, or within 30 days, of the personnel of the Annual Meeting Arrangements Committee.

2. The Secretary of the American Society of Dentistry for Children formulate a letter to each Unit President informing them of the seriousness of their failure to inform the Business office of changes in officers and that said letter be published in the Journal so that Unit members will be encouraged to cooperate with their Unit Officers, the National Secretary, and the Business Manager.

3. That Executive Council action on the proposed contract with the Williams and Wilkins Company for managerial services be accepted as approval, or disapproval of the adequacy of the managerial service and that if approved the contract be extended at each Annual Meeting, subject to changes as negotiated.

4. The Editor be directed to publish the Constitution and By-laws as amended on September 30, 1956, and that 100 reprints of the instrument be held by the American Society of Dentistry for Children Secretary for distribution upon request.

5. That Committee Reports be submitted first to the Secretary, who shall furnish a copy to the Editor, who shall edit the workings of recommendations submitted, and publish same.

HUGH KEENAN
HAROLD ADDELSTON
ALFRED SEYLER, *Chairman*

II. *Amendments to the Constitution and By-Laws*

A. *Article IV, Section 2 of the Constitution*

It was moved by Dr. Anderson and seconded by Dr. Rabinowitch, that

Section 2 of Article IV of the Constitution be changed to read as follows: State Units must have a minimum of 20 active members, or 5 per cent of state dental association membership. Where it is impossible to maintain a minimum of 20 active members, or it is otherwise desirable, it is recommended that such groups join with others in the formation of a Multi-State Unit. A minimum of 20 active members is necessary for the maintenance of such Units. In any Unit where the membership drops below the required membership of 20, or 5 per cent of the state dental association membership, members shall be considered members of the Society at large. This motion was passed unanimously.

B. *Article IV, Section 4 of the Constitution*

It was moved by Dr. Rabinowitch and seconded by Dr. Douglas, that Section 4 of Article IV of the Constitution be amended to read as follows: In a State Unit where 20 or more members exist in each of two or more geographically separated areas, a separate Unit may be organized for each of these areas in order to conserve many miles of travel to meetings. It was moved by Dr. Higue and seconded by Dr. Anderson that this motion be tabled. The motion to table was carried, and the proposed amendment was referred back to the Constitution and By-Laws Committee for further study.

C. *Article IV, Section 3 of the Constitution*

It was moved by Dr. Anderson and seconded by Dr. Mack that Section 3 of Article IV of the Constitution be amended to read as follows: State Units shall send official delegates or representatives to each Annual Meeting of the Society. One delegate shall be sent to represent each 50 members, or fractional number thereof, as of April 1st of each year. The motion passed unanimously.

D. *Article IV, Section 1 of the By-Laws*

It was moved by Dr. Rabinowitch and seconded by Dr. Sweet that Section 1 of Article IV of the By-Laws have the following section added: A new Standing Committee to be called the Annual Meeting Committee. The motion passed unanimously.

III. *Nominations and Elections*

A. *American Board of Pedodontics Member*

Dr. Charles Sweet, Jr. nominated Dr. Gordon Rovelstad for membership on the American Board of Pedodontics to replace Dr. Ralph Ireland whose term expires. It was moved and seconded that the nominations be closed and that the Secretary cast a unanimous ballot for Dr. Rovelstad. The motion carried.

B. *A.S.D.C. Officers*

Dr. Hunnicutt made the following nominations: President, Lawrence R. Burdge; President-elect, Albert L. Anderson; Vice-President, Harold K. Addelston; Secretary-Treasurer, William E. Brown; Executive Council Members, Paul M. Weber, 2-year Councilman; C. Frank Tuma, 2-year Councilman; George J. Higue, 1-year Councilman. It was moved and seconded that the nominations be closed and the Secretary be instructed to cast a unanimous ballot for the slate of officers. The motion carried.

WILLIAM E. BROWN
Secretary-Treasurer

A New Approach to the Topical Application of Fluorides in Children, With Results at the End of Two Years

Charles W. Gish,* Charles L. Howell,* and Joseph C. Muhler†

In a previous publication (1), the clinical procedure followed throughout this study, and the results at the end of one year were presented. The marked advantage of a single topical application of stannous fluoride over the conventional four treatments of sodium fluoride was shown by the clinical results which indicated a significant superiority of the single application of stannous fluoride. This paper presents the clinical dental caries data at the end of two years; namely, the results for Group I which began two years ago and which has now received a single application of an 8 per cent solution of stannous fluoride once a year, and Group II which started one year ago and has received only one application of an 8 per cent solution of stannous fluoride. Both groups are compared to their appropriate controls treated simultaneously with a series of four applications of sodium fluoride once each three years.

Experimental

The method of dividing the children into their respective treatment groups, the technique of application and the clinical procedure have been previously described (1). Essentially, this study is designed to run for a five-year period, with new second grade children added each year. Each group of new second grade children will receive either a single application of stannous fluoride or four applications of sodium fluoride. The group receiving the stannous fluoride will be treated once each year, while those receiving sodium fluoride will be treated every third year. The same dentist (C. W. G.) is performing all of the clinical examinations.

Data and Discussion

The results of this study are shown in table 1, and indicate the findings for children in Group I who have now received two single stannous fluoride applications one year apart and those children who have received one series of four applications of sodium fluoride, as well as children in Group II which were started one year ago and have received only one application of stannous fluoride or four applications of sodium fluoride. In Group I, the dental caries increments in terms of DMFS and DMFT indices indicate a significant superiority of a single application of stannous fluoride at the end of one year. At the end of two years this same group has maintained its significant superiority for the children receiving the stannous fluoride. After two years, there is a 32 per cent superiority for the children receiving the stannous fluoride as compared to those receiving the sodium fluoride when the

* Indiana State Board of Health, Indianapolis, Indiana.

† Department of Chemistry and School of Dentistry, Indiana University, Bloomington, Indiana.

TABLE 1

A Comparison of the Effectiveness at the End of 2 Years of a Single Application Per Year of an 8 Per cent Solution of Stannous Fluoride to a Series of Four Applications of Sodium Fluoride Once Every Three Years

Group	Time of Examination	Agent	No. of Subjects	DMF Teeth		DMF Surfaces	
				Increment	% Reduction	Increment	% Reduction
I	1 year	NaF	242	0.76		1.25	
		SnF_2	247	0.60	21 (p = .08)*	0.93	26 (p = .025)
	2 year	NaF	222	1.08		1.94	
		SnF_2	226	0.73	32 (p = .004)	1.53	21 (p = .04)
II	1 year	NaF	237	0.58		1.19	
		SnF_2	230	0.24	59 (p = .0007)	0.52	56 (p = .0002)

* Calculated on the basis of the T test.

DMFT index is used, and a 21 per cent superiority when the DMFS index is used. Both of these reductions are significant as indicated in table 1. These increments were computed by taking into consideration all surfaces of the teeth and assigning values (3 for posterior and 2 for anterior) for teeth extracted after the start of the study. If, however, there were more than 3 surfaces attacked on the posterior teeth or 2 on the anteriors, the appropriate values were assigned. When a summary of the two-year data was made which omitted these teeth which had been extracted after the start of the study, the reductions indicated a 36 per cent superiority for the children receiving the stannous fluoride as compared to those receiving the sodium fluoride when the DMFT index is used, and a 33 per cent superiority when the DMFS index is used.

In Group II, there is a 59 and 56 per cent superiority for stannous fluoride in terms of the DMFT or DMFS indices, respectively. Again, if the DMFT or DMFS indices were computed by omitting teeth and surfaces extracted during the study, the data show a 61 per cent superiority for the stannous fluoride using the DMFT index and a 69 per cent superiority using the DMFS index. These data suggest that more study be given to the values assigned missing teeth and surfaces which occur during the period of the clinical dental caries study. The reason for the greater effectiveness for the Group II children at the end of one year when compared to the Group I children at the same period is not known.

The results of this clinical study indicate a continuation after a two-year period of the significant advantage of a single application of stannous fluoride found at the end of one year. If this significant superiority continues for even longer time periods, a significant contribution to preventive dentistry will be available for the general practitioner. This technique is of particular importance to the pedodontist, since he most frequently must see the young patient at least once a year, and at this appointment a single application of stannous fluoride can materially add to the management of his caries control program by means of a simple, quick and clinically effective technique.

Summary

At the end of a two-year period a single application of a freshly prepared

8 per cent solution of stannous fluoride applied once each year was significantly more effective in reducing dental caries in children than a series of four applications of a 2 per cent sodium fluoride solution applied at the beginning of the two-year study period. These clinical results indicate a marked advancement in topical fluoride treatment in preventive dentistry due to a saving in clinical time, cost, patient and parent convenience and an increase in effectiveness.

REFERENCE

1. Gish, C. W., Howell, C. L., and Muhler, J. C.: A New Approach to the Topical Application of Fluorides for the Reduction of Dental Caries in Children. J. Dent. Res., In press.

NOTICE

Charlie Oxar, 1957 Convention Coordinator, has received the following communication relative to convention expense deductions, from Laurie W. Tomlinson, U. S. Treasury Department, Internal Revenue Service, Jacksonville, Florida:

> "The test of the deductibility of business expenses is whether they are ordinary and necessary in the light of all the circumstances involved. Only to the extent, therefore, that the meeting in question is attended for business purposes with a reasonable expectation of deriving a business benefit will the individuals be entitled to a deduction under section 23(a)(1)(A) of the Internal Revenue Code. Any expenses thus incurred which represent deductible traveling expenses may be taken into consideration in computing adjusted gross income.
>
> Expenses incurred for personal tours are, of course, not deductible."

Just another reason for you to join us in Miami Beach in November!

A.E.S.

A Diagnosis and Treatment Plan for Traumatized Anterior Teeth

NATHANIEL H. LENCHNER, D.D.S.

THE increased complexity of everyday living has produced a rise in the incidence of all types of accidents. Dental accidents, i.e. accidents which result in dental injury, have likewise increased. The dental accident most frightening to a parent is one that involves the anterior teeth of a child. The distraught parent envisions the child going through life with broken or missing front teeth. At the time of the accident, no one is less concerned than the child himself. However, in time, unless corrective measures are taken, the child may become emotionally disturbed due to the unesthetic appearance of his teeth.[3, 5, 6, 7, 16] In most cases, simple measures taken by the dentist soon after the accident will maintain the tooth involved as a healthy, functioning, esthetic unit of the dental apparatus for a long period of time. These measures prevent the young child from becoming a 'dental cripple' early in life.

Many authors[16, 20, 22] who have discussed this subject seem to agree that probably the most important predisposing factor in fractured anterior teeth is protrusion with inadequate lip coverage. Deformities of this type must unquestionably be linked with thumbsucking and similar habits. We, therefore, have still another reason for the intelligent breaking of this habit early enough in the child's life to avoid permanent deformity.

This paper will attempt to set forth a diagnosis and treatment plan for the various types of fractured anterior teeth. Each case must be considered individually since each accident will invariably present a different combination of circumstances with varying degrees of disturbance of the hard and soft structures.

Prior to any attempt at treatment, a complete and accurate diagnosis is of utmost importance. In evaluating the case, it is essential to include a detailed history, clinical examination, vitality test, and radiographic examination. The history should include the routine medical and dental history to determine the general health of the patient and his past dental experience, which may aid in the evaluation of the expected response and any management problems. However, it will also be necessary to include when and how the accident occurred and any history of pain or soreness. It should be ascertained if there was any previous trauma involving the same area because the prognosis is better in a tooth which has not sustained previous injury.[22]

The clinical examination should include inspection of the type and extent of the injury, examination of the soft and hard surrounding structures, tests on the teeth by percussion, transillumination and for mobility, and an examination of the occlusion.

Vitality tests should include several of the adjacent teeth so that comparisons may be made. It should be borne in mind that a negative response to the pulp tester any time during the week following the injury need not indicate that the tooth is non-vital. Following trauma, the pulp tissue may be in a state of shock for varying periods up to seven to ten

days and thereby fail to respond to the pulp tester.[3, 4] It is therefore necessary to keep such teeth under constant surveillance and repeat testing after a short waiting period.

Radiographic examination should include films of the adjacent as well as the injured structures. One should note from the radiographs the proximity of the line of fracture to the pulp, complications such as root fracture or rarefied areas, and the stage of development of the tooth concerned. The radiographs should be mounted and filed so that subsequent films may be compared with them.

After evaluating the facts obtained in the examinations, an accurate diagnosis and prognosis may be offered. The parent should, however, be informed that even though at this time the prognosis appears favorable, the pulp may die because it often takes six to eight weeks for a pulp devitalized by an injury to become putrescent and give distress.[12] The case may now be classified for treatment purposes. (Fig. 1)

I. Fracture of the crown structure (permanent teeth)
   A. Fracture in enamel only
   B. Fracture involving dentin
   C. Fracture exposing the pulp tissue
      1. Pulp remaining vital
      2. Pulp becoming non-vital
II. Fracture of the root structure (permanent teeth)
III. Displacement of the tooth with or without fracture (permanent teeth)
   A. Moderate displacement
   B. Severe displacement
      1. Intrusion
      2. Extrusion
   C. Total displacement
IV. Fractures of primary teeth
   A. Fracture of the crown structure
   B. Fracture of the root structure
   C. Displacements

Fracture of the Crown Structure of Permanent Teeth Involving Enamel Only

In simple fractures of this sort, it will usually only be necessary to smooth any sharp edges with sandpaper disks. Though the injury is a minor one, the case should be observed for several months so that any degenerative changes in the pulp may be quickly noted and treated (I, C, 2). Traumatized teeth which show minor fracture or none at all are more likely to result in pulp death than those which result in extensive fracture of the crown or root structure. This is true because although the crown structure resists the force, the entire shock is transmitted to the apex resulting in tearing of the apical vessels and therefore pulp death.[4, 10] After it has been determined that the pulp has withstood the shock, the injured and adjacent teeth can gradually be dressed down until an esthetic appearance is obtained. Restorations are rarely indicated in these cases.

Fracture of the Crown Structure of Permanent Teeth Involving Dentin

If only a small amount of dentin is involved, disking will again usually suffice. The dentin, however, should be desensitized with ninety-five percent phenol, eight percent zinc chloride solution, or sodium fluoride paste. It should then be covered with one or more layers of protective varnish.[6] However, where the dentin is extensively involved, the pulp should be further protected. The tooth should be isolated, cleaned and dried. A small amount of calcium hydroxide methyl cellulose paste (Pulpdent) is applied over the exposed dentin. The calcium hydroxide paste after being allowed to dry is then covered with any

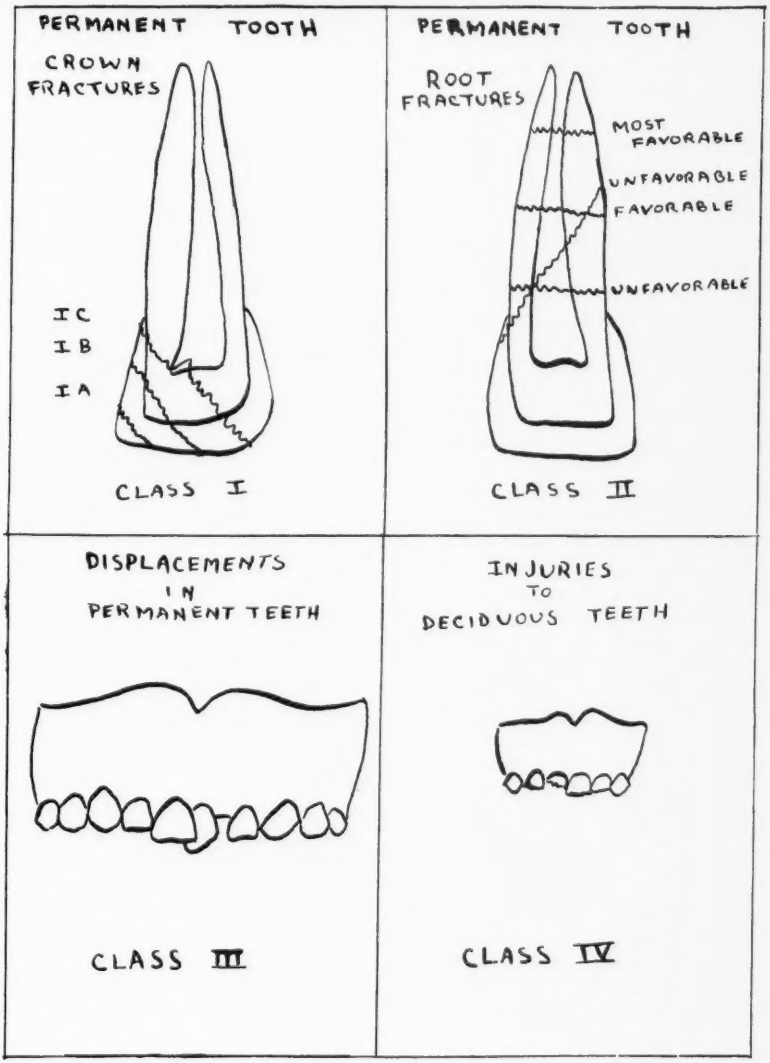

PERMANENT TOOTH
CROWN FRACTURES
IC
IB
IA
CLASS I
PERMANENT TOOTH
ROOT FRACTURES
MOST FAVORABLE
UNFAVORABLE
FAVORABLE
UNFAVORABLE
CLASS II
DISPLACEMENTS IN PERMANENT TEETH
CLASS III
INJURIES TO DECIDUOUS TEETH
CLASS IV

FIG. 1

suitable cement. It has been suggested that when using zinc-oxyphosphate cement, a layer of paraffin first be flowed over the calcium hydroxide in order to prevent an acid-base reaction between the free acid in the cement and the alkaline calcium hydroxide.[23] If the cement is mixed according to the Noyes-Whitney equation (i.e. small amounts of powder incorporated into the liquid, mixing over a large area for a long time, etc.[13]), there will be relatively little free acid and it will be unnecessary to use paraffin or any other intermediary substance. A suitable resin crown form is then selected and trimmed so that it is free of the gingival margin and does not interfere with the occlusion. It is then filled with the desired shade of fast setting acrylic resin or silicate cement and seated over the tooth. After allowing time for hardening, it should be trimmed of excess and the occlusion again examined and adjusted. It is often desirable to have a more durable type of immediate restoration than an acrylic crown. If the case requires this measure, a steel crown may be used, preferably with the labial surface cut out and replaced with an appropriate shade of acrylic resin or silicate cement. The patient is advised to return in one week for observation. If at this time, the examination is negative, the patient is dismissed for an eight week period. After this waiting period, if the examination is still negative, an intermediary restoration may be considered. The restoration should not only restore lost tooth structure but should be esthetic. A plastic filling using a previously cemented gold[3] or stainless steel wire for added retention, a gold inlay or three-quarter crown with a silicate or acrylic window, a shoulderless acrylic jacket, or a shoulderless veneer crown will solve almost any problem arising from the need for an intermediary restoration in this type of fracture. This intermediary restoration should be left in place until complete eruption and recession of the pulp tissue will allow for the placement of a more permanent type of restoration such as an acrylic or porcelain jacket crown or a veneer crown. It should be remembered that there is no wear with a porcelain jacket crown and thus the life expectancy of a properly constructed porcelain jacket crown is longer than that of an acrylic jacket crown.[11]

Fracture of the Crown Structure of Permanent Teeth Involving the Pulp Tissue—Pulp Vital

If the pulp has been exposed by the injury, we have several alternative methods of treatment: pulp capping (Fig. 2a), pulpotomy (Fig. 2b), total pulpectomy, extraction. Where possible, our prime objective in treating vitally exposed pulp is the maintenance of the vitality of the residual pulp to permit continued root formation.[24] Pulp capping and pulpotomy, when successful, accomplish this objective and must therefore be considered the procedures of choice. It is the opinion of this observer and others[23] that in practically all cases of a traumatically exposed pulp, the tissue will be at least partially infected and therefore pulpotomy is indicated. A high percentage of success with pulp capping has been reported,[17, 21] but very few, if any, of these cases were on fractured teeth. It follows therefore that in practically all cases of traumatically exposed vital pulps, it will be necessary to perform pulpotomies. Adequate anesthesia is obtained. The tooth is isolated with rubber dam and the area fixed. Adequate access to the coronal portion of the pulp chamber is obtained by making a large v-shaped excavation on the lingual surface down to the roof of the pulp chamber (leaving the

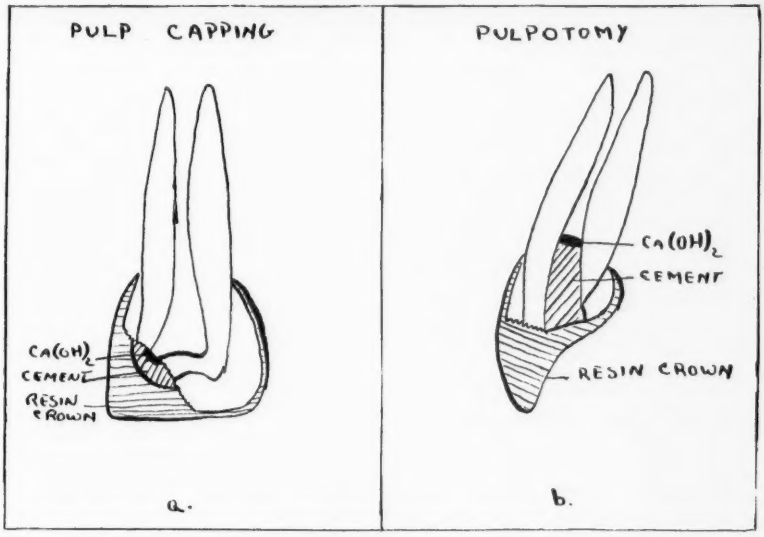


FIG. 2

root intact if possible). The roof of the chamber can now be removed by cutting around the periphery with a #700 tapered fissure bur and lifting it out. In this way minimal damage will be done to the pulp tissue itself. The pulp tissue is now removed (preferably with a sharp excavator or curette) to about one or two millimeters rootwise of the crown. The pulp chamber may now be swabbed with a sterile cotton pellet soaked in a 3% solution of hydrogen peroxide and then dried with sterile cotton pellets. During these procedures, it is important to make sure that no pressure is transmitted to the root stump. After the coronal pulp chamber has been thoroughly cleansed and the bleeding has stopped, the pulp tissue of the root stump is covered with either a mix of calcium hydroxide and water or calcium hydroxide methyl cellulose paste (Pulpdent). A thin mix of cement is flowed over the calcium hydroxide and allowed to set. A thicker mix of cement may now be placed over the first layer of cement. A suitable crown form should now be placed over the tooth as described above. A post-treatment radiograph should be taken and the patient advised to return in one week for observation. At that time, a thorough examination including radiographs should be performed. If the results are negative, the patient should be dismissed for eight weeks. At this time, again a complete examination should be done. If negative, an intermediary type of restoration should be made in order to more adequately protect the tooth. At this time, it should be possible to demonstrate radiographically that a deposition of secondary dentin (a 'dentin bridge') has taken place just below where the calcium hydroxide has been placed.[21, 24] The intermediary res-

toration may take the form of a three-quarter crown with a silicate or acrylic window, a shoulderless acrylic jacket, or a shoulderless veneer crown. The patient must be conscientiously checked at frequent intervals and a continuation of root development and absence of symptoms will be observed in successfully treated cases. When root formation is completed, complete root canal therapy (Pulpectomy) should be instituted immediately so that the further danger of continued calcification of the root canal or internal resorption will be obviated.

Other methods of pulpotomy have been described in the literature with claims of varying degrees of success. The most widely described is probably the technic employing zinc oxide and eugenol, either alone or in combination with other medicaments. Although these procedures have, in many cases, proven highly successful when judged by radiographic and symptomatic findings, Zander and his associates[23, 24, 25] by histologic technics have shown that no actual healing (i.e. formation of new dentin over the site of exposure) takes place. These investigators have conclusively demonstrated that with the use of calcium hydroxide or certain other substances containing calcium and/or phosphate, there is a deposition of new dentin, or healing, within a period of four to eight weeks. Some success has also been reported using dentin powder, but this is similar to using calcium hydroxide because of its high calcium content.[19] It is not to be assumed, however, that the use of calcium hydroxide and the proper technic assures success. It is true that the prognosis is usually good but failures do result.[24] Success in either pulpotomy or pulp capping depends to a large degree upon the proper selection of cases, a sterile technic, avoidance of pressure at all stages, and the conscientious following of all cases.

Fracture of The Crown Structure of Permanent Teeth Involving the Pulp Tissue—Pulp Non-Vital

Whenever the trauma has resulted in a non-vital pulp, we must either perform a total pulpectomy or extract the tooth. Pulpectomy in a tooth with an incompletely closed apex presents difficulties due to the funnel shape of the apex with the resultant inability to adequately seal the root canal filling at that point. In many cases, this can be overcome by apicoectomy and sealing of the filling material from the apical end. This is only possible if enough of the root has already been formed to permit stability after amputation of the apex. This problem of stability does not often arise because teeth in the earlier stages of development more readily recover from shock and resist devitalization since there is a more adequate blood supply through the wide open apical foramen. Obviously, it will be necessary to thoroughly remove all pulp tissue from the canal and completely fill and seal it with the filling material chosen. In many cases, no restoration will be necessary, but bleaching may be indicated for esthetic reasons. If it is necessary to construct a porcelain jacket crown, the entire crown should be cut off to the gingival margin and enough of the root canal filling removed to allow for retention of a gold post. The root canal is widened and a gold post is waxed and cast. The post is cemented into position and the tooth reprepared. A porcelain jacket is now constructed in the usual manner.

Fracture of the Root Structure of Permanent Teeth

An injury which results in a fracture of the root structure is often less serious and easier to treat than one which results in a fracture of the crown structure. In fact, many root fractures are not seen by a

dentist until years after they occur, when they are noted on routine radiographic examination. In most of these cases, the tooth is vital and quite stable. Often, the patient is unaware that any damage had been done to the tooth and in many instances no longer can recall how the injury was sustained. Kronfeld points out that the healing of a fractured root requires the same conditions that are necessary for the healing of a bone fracture: 1) close approximation of the fragments, 2) immobilization of the fragments, 3) absence of infection, 4) a patient in good general health.[10] Further, in order that we may expect good stability upon healing, the fracture line should not be in the cervical third of the root.[6] Hence, the prognosis in cases of root fracture is favorable if the above conditions are met and the pulp remains vital, and the prognosis is unfavorable if the above conditions are not met and if the pulp is non-vital or there is a considerable amount of irreducible displacement or malalignment of the fragments. The treatment is evident from the above discussion. Reduction of the fracture under either local or general anesthesia is accomplished by digital manipulation. The tooth is immobilized by a splint which is left in place from three to six months as the individual case requires. Almost any type of splint will serve. Many wire splints have been described which will remain in place for the required period of time.[6, 9] However, if desired, a more permanent type cast or acrylic resin splint can be constructed and cemented to place.

Displacements of Permanent Teeth

Moderate Displacement

If only a slight amount of displacement has been produced, very little treatment is indicated. Warm saline mouth washes should be prescribed and the occlusion relieved if required. The patient should be advised of possible pulp death and the need for periodic checks. If there is a slight amount of extrusion, the tooth may gradually be dressed down to an esthetic appearance.

Severe Displacement—Intrusion

Intrusion will in many cases produce pulp death because it often causes a crushing of the apical vessels. Warm saline mouth washes should be prescribed and the patient advised of possible pulp death and the need for periodic examination. In most cases, if the pulp tissue remains vital, the tooth will re-erupt soon after the accident and come into a position approximating the normal.[2]

Severe Displacement—Extrusion

In cases of severe extrusion, the displacement should be reduced, under anesthesia, by digital manipulation.[6, 8] The tooth is then immobilized by splinting. The splint is left in place until the tooth exhibits sufficient stability. The tooth should be examined periodically to determine any further pulpal effects.

Total Displacement

Often freak accidents occur in which a tooth is completely dislodged from its socket with little apparent damage to the tooth or surrounding structures. Replantation may on rare occasions be attempted.[2, 6, 10, 14, 15] However, in most cases, the time element will contraindicate replantation. This does not obviate treatment because in most cases of loss of a permanent incisor tooth, there is eventual interference with phonetics, esthetics, and occlusion. Further, we must not forget the psychological implications of an unattended deformity. In these cases, it becomes necessary to construct some sort of temporary appliance to serve until a more permanent type

restoration such as a unit built porcelain jacket crown bridge can be constructed. A fixed space maintainer will usually be quite unesthetic and therefore is rarely indicated. A removable partial denture will usually satisfy all of the above requirements and therefore is the restoration of choice in these cases. The design of the partial denture should be one which will not interfere with development.[6, 7] It may therefore be necessary to construct more than one partial denture while waiting for development to advance to a stage sufficient to allow for the placement of the final restoration.

Fractures of Primary Teeth Involving the Crown Structure

The treatment of primary teeth in which the crown has been fractured is not very different from the treatment of similarly injured permanent teeth. These fractures will usually involve the pulp tissue because of the smaller amount of hard tooth structure covering the pulp in primary teeth. If the tooth remains vital the treatment indicated is pulpotomy and restoration. Our main consideration is maintenance of the tooth in a vital condition so that resorption of the root will go on in a normal manner and will not interfere with the development of the succedaneous tooth. Therefore, it follows that if the pulp becomes non-vital, extraction is indicated. Replacement, in these cases, is only indicated where esthetics is of great importance. The normal growth pattern will leave ample space for the permanent successor. However, in cases where the primary canine has not yet erupted and the primary lateral incisor is lost, it would be possible for the canine to erupt in an abnormal mesial position[1] and eventually cause some disruption in the alignment of the permanent teeth. However, there seems to be no recommendation for the prevention of this condition.

Fractures of Primary Teeth Involving the Root Structure

The criteria for successful treatment in root fracture involving primary teeth are the same as in permanent tooth root fracture. However, in most cases, this type of injury to an anterior primary tooth presents unfavorable conditions and necessitates extraction.[1]

Displacement of Primary Teeth

Injuries which result in the displacement of primary teeth (either intrusion or extrusion) are generally treated in the same manner as their permanent counterparts. The complications that may arise will frequently involve not only the primary tooth but the permanent tooth which lies under it. Traumatic intrusion of a primary tooth even when followed by apparent uneventful re-eruption[18] may dislodge the crown portion of the developing tooth and thereby cause the root to fail to develop in line with the crown. If the root develops at an angle to the crown, the condition is known as dilaceration.[10] Further, a disruption of the calcium deposition or root formation may cause other malformations of the permanent tooth.

Summary and Conclusions

1. A diagnosis and treatment plan for injuries to primary and young permanent anterior teeth has been presented.

2. It is within the realm of every practicing dentist to perform these services when such cases present in his practice.

3. A complete diagnosis including clinical examination, detailed history, vitality testing, and radiographic examination should routinely be practiced in cases of

trauma regardless of how minor the injury may seem.

4. The psychological effects of untreated injuries should not be minimized.

5. All injured teeth, regardless of treatment performed, must be followed for extended periods to detect the degenerative changes of the pulp which are not immediately evident.

6. Pulpotomy, as described, is a highly successful means of treating traumatized teeth with vital pulp exposures.

7. All restorations should accomplish the following: esthetics, phonetics, function, and space maintenance when required.

8. No replacement, either fixed or removable, should interfere with the developmental pattern.

9. The healing of a fractured root depends upon the same factors as does the healing of a bone fracture.

10. Replantation of a completely dislodged tooth may be attempted but with a guarded prognosis.

11. Traumatized primary teeth should receive early and thorough treatment.

12. Injuries to primary teeth may frequently involve the permanent successors.

13. Anterior primary teeth devitalized by injury should be extracted.

14. No space maintenance is required when an anterior primary tooth is lost because the normal growth pattern will leave ample room for the succedaneous tooth.

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Book Reviews

Your Child's Teeth. By EDGAR S. BACON, D.D.S.

Every dentist in general practice is constantly besieged by parents asking questions about the health of their children's teeth. Sometimes these questions are very simple and easy to answer. Others are more difficult and quite involved. Often the dentist is not quite sure what the latest scientific opinion is, or just what he should say.

Now, a new book has appeared that gives authentic answers to 180 questions commonly asked by parents. It has been written by Dr. Edgar S. Bacon of New York City, who has compiled it from his long years of experience. The information has been checked and approved by the A.D.A. and by a number of dental scientists in this field. It has been endorsed by dental educators and has been acclaimed by many mothers who have read it. It gives to the mother an authoritative and clear answer to practically every question she can ask the dentist about her child's teeth.

Now the dentist, as well as the pedodontist, can provide himself with a supply of these little books which he can hand out to his inquiring mothers. They will save him much time. They will be welcomed and appreciated by all parents of small children. E. P. Dutton & Co. of New York is the publisher. The cost is $2.50.

R. W. BUNTING

Clinical Pedodontics. By SIDNEY B. FINN, D.M.D., M.S. *et al.* First Edition 1957. 664 pages, 275 illustrations. W. B. Saunders Co., Philadelphia.

Dr. Finn, Professor of Pedodontics at the University of Alabama, School of Dentistry, aided by the contributions of seven other prominent members of the faculty, has assembled twenty eight chapters pertaining to the practice of dentistry for children.

The author states in the preface that this is a textbook prepared for the teaching of undergraduate dental students and for the general practitioner who wishes to keep abreast of newer concepts and techniques in the field of pedodontics.

This textbook presents thoroughly some new subject matter that generally has not been covered in the past by other pedodontic texts. For example: among the subjects included are: parent counseling, pain and sedation, face development, mouth protectors, oral surgery for children, treatment of the handicapped child, hereditary factors in pedodontics, nutritional disorders, hormonal disturbances and five chapters on epidemiology, etiology, prevention and diet in dental caries.

This reviewer feels that the chapters on pain and sedation, face development and tooth eruption, preventive orthodontics, oral surgery, antimicrobial agents and the chapters on dental caries should be singled out for special mention. They are erudite and practical. The dental caries section could almost be a monograph in itself. The orthodontic section is well illustrated and clear in text.

The chapter on treatment of the handicapped child is a bit disappointing. This subject which is being treated more in textbooks has become recognized as an entity in the field of pedodontics. Cerebral palsy, feeblemindedness (mental retardation), epilepsy, hemophilia are discussed but briefly as the major part of the chapter deals with cleft palate.

In the preface the author states that an attempt has been made to mix the theoretical with the practical, but to place the emphasis on the practical. To this end, the reviewer feels that the purpose was accomplished. But it was accomplished to such a great degree, that the book becomes more than a text for the undergraduate student and the general practitioner. It is truly a textbook for the specialist in pedodontics.

The format and type make for easy reading.

HUGH M. KOPEL